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FLORA OF PERU

BY

J. FRANCIS MACBRIDE

CURATOR, PERUVIAN BOTANY

BOTANICAL SERIES
FIELD MUSEUM OF NATURAL HISTORY
VOLUME XIII, PART V, NUMBER 1
DECEMBER 23, 1959

PUBLICATION 880

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FLORA OF PERU

J. FRANCIS MACBRIDE

HALORAGACEAE P. Br. Water Milfoil Family

Reference: Schindler, Pflanzenreich IV: 225. 1905.

Herbs, annual or perennial, sometimes suffrutescent, sometimes aquatic. Stipules none. Leaves opposite or verticillate, when submersed usually pinnate. Flowers ordinarily minute, hermaphrodite or unisexual, the calyx tube adnate with 4 (or 2, 3 or none) lobes, the petals 4 or 2 or none, rarely 3. Stamens 8 or 4 (sometimes 6, 3 or 2 or none), the anthers basifixed, laterally dehiscent. Ovary hypogynous, 1–4-celled, the stigmas papillose or plumose. Ovules pendulous. Fruit usually minute, nutlike or drupaceous, angled sulcate or winged, 1–4-seeded nuts, the seeds with fleshy often copious albumen.—Nearest Onagraceae but differing in fruit, albumen and in anatomical features. The name has been written as Halorrhagaceae.

The highly decorative Gunneras are frequently used by landscape architects for their handsome foliage, while the "Parrot Feather," so popular for aquaria, is a species of *Myriophyllum* (*M. brasiliense* Camb.), allied to the Peruvian plant.

Scapose herbs; ovary 1-celled........................1. *Gunnera.*

Caulescent, the flowers usually minute in the leaf-axils; ovary 2–4-celled.

Calyx lobes persisting; fruit nutlike; creeping-ascending plant.
2. *Laurembergia.*

Calyx lobes caducous; fruit 4- (or 2-) parted; aquatic.
3. *Myriophyllum.*

1. GUNNERA L.

Perennials, sometimes gigantic, often scabrous or hispid-pilose, sometimes glabrous, with creeping or suberect rhizome. Petioles equaling or exceeding the broad serrate to lobed leaves. Inflorescence often large, a scapose spike, raceme or panicle, the branches then bracted, bractlets usually lacking, the male flowers mostly at the branchlet tips. Calyx tube usually (hermaphrodite flowers) ovoid or compressed with 2 thick laciniate lobes; petals 2 or none, oblong, concave, laciniate; stamens and styles 2, the former with stout filaments and elliptic anthers, the latter subulate or compressed, papillose their entire length.—In male flowers the calyx tube is reduced, filaments slender, style rudimentary or none; in female the stamens aborted, ovary 1-celled, 1-ovuled. Fruit drupaceous or nutlike. Named for an erudite friend, E. Gunner. More collections and probably cultivation are needed to prove the validity of the characters used to define the species, including those proposed by me.

Low, stoloniferous plant........................*G. magellanica.*
Large, even gigantic plants.
  Sepals evidently persisting, crowning the faded flower and fruit.
    Leaf lobes 5–7, obtuse, obscurely repand-dentate....*G. Bolivari.*
    Leaf lobes 7–9, acute, minutely dentate or incised.
      Petioles scabrous-aculeate..................*G. Margaretae.*
      Petioles smooth...............................*G. Annae.*
  Sepals all or nearly all deciduous after anthesis, in fruit appearing as minute calluses.
    Inflorescence open; leaf lobes short, broad........*G. peruviana.*
    Inflorescence very dense; leaf lobes oblongish......*G. rheifolia.*

Gunnera Annae Schindl. Repert. Sp. Nov. 9: 124. 1911.

Rhizome not stoloniferous, densely clothed with thin puberulent much incised ligules that are somewhat dilated apically; petioles smooth, stout, as much as 6 dm. long; leaves cordate at base, palmately orbicular with 7–9 narrowly triangular acute minutely dentate lobes that extend to half the breadth of the leaf, the upper surface prominently areolate or nearly smooth, some areoles scabrous, the nerves, especially beneath, appressed pilose; inflorescence subcylindric, long-attenuate toward tip, the scape with some ligules, shorter than the leaves, many flowered, to 1.5 meters long, the primary axis appressed pilose, bracts none or evanescent, flowering branchlets many, ascending; flowers all "proterandrice" hermaphrodite, sessile, glabrous; sepals 2, triangular, very thick, persisting; petals not seen; stamens 2, the anthers evidently shorter than the filaments, scarcely apiculate; stigmas 2.—Cf. species mentioned under *G. Margaretae.* F.M. Neg. 3551.

Huánuco: Moor, 3,300 meters, southwest of Monzón, *Weberbauer 3721*, type.

Gunnera Bolivari Macbr. Field Mus. Bot. 11: 32. 1931.

Petioles and inflorescence glabrate or glabrous, reddish-purple, the latter apparently ebracteate (the bracts minute), little attenuate to the apex, the peduncle nearly 1 dm. long, the flowering portion at least thrice as long, about a third as broad, the many but not at all crowded branches strongly spreading, slender and little enlarged in fruit, mostly 5 cm. long; leaves not deeply but obtusely 5–7-lobed, obscurely repand-dentate, green, glabrous and smooth above, paler and only the nerves sparsely and finely pilose beneath; sepals somewhat persisting; ovary ovoid.—Imperfectly known but no doubt large, and apparently because of its glabrate leaves and essentially ebracteate inflorescence related only to *G. pyramidalis* Schindl. of Juan Fernandez, more pubescent, the inflorescence pyramidal, and *G. Margaretae* Schindl., the leaves narrowly lobed. Named for the liberator.

Cuzco: Cerro de Cusilluyoc, *Pennell 13989*, type.

Gunnera magellanica Lam. Dict. 3: 61. 1789; 112.

Dioecious, the thick rhizome densely covered with large brown membranous appressed scales, stoloniferous, the stolons several cm. long, sparsely long-pilose, developing new plants; petioles to 2.5 cm. long, densely appressed or ascending pilose, especially the younger like the leaf-nerves beneath; leaves subreniform to orbicular, openly but often deeply cordate, crenate, to 11 cm. long, nearly glabrous above, the margins ciliate-pilose; male scapes usually as long as or longer than the leaves, erect, the flowers peduncled and pedicellate in a dense thyrsoid panicle; calyx lobes narrow, acute, pilose, about 8 mm. long, petals none; filaments filiform, the ovoid apiculate anthers 2.2 mm. long, 1.3 mm. broad; ovary none; female floral scape always shorter than the leaves, the flowers sessile, the bractlets minute, caducous; calyx tube 1.6 mm. long, obscurely 4-lineate, glabrous, the lobes 5 mm. long; petals and stamens none; fruits congested, globose, glabrous.—Illustrated, Pflanzenreich l.c. 113.

Amazonas: Almirante, east of Chachapoyas, 2,900 meters, *Weberbauer 4428* (det. Schindler).—San Martín: Frequent, wet lomas, (*Weberbauer*, 266).—Cuzco: Cuzco to Santa Ana, 2,900 meters, (*Weberbauer*, 244). Colombia to the Straits.

Gunnera Margaretae Schindl. Repert. Sp. Nov. 9: 125. 1911.

Rhizome non-stoloniferous, densely clothed with glabrous laciniate ligules about 5 mm. long; petioles to at least 6 dm. long, roughened with many scabrous aculei; leaves depressed reniform, somewhat broader than long, about 5 dm. wide, deeply cordate and with 9 broadly triangular shortly acute lobes, these incised, the primary sinuses at about a third of the leaf, the entire margin densely and minutely dentate, prominently areolate above, appressed pilose only on the nerves, especially beneath; inflorescence thyrsoid, the scape 1.5 dm. long, subglabrous, scabrous, shorter than the leaves, densely many-flowered, long-ovoid, well rounded toward base and apex, to 1.5 dm. long, the axis subglabrous, the primary bracts linear, absent below, the densely flowered branchlets spreading-erect; flowers as in *G. Annae;* petals 2, in upper flowers well evoluted, in the others reduced to 1 or obsolete, broadly cochleiform; anthers a little longer than the filaments.—*G. pilosa* Kunth, 120, of Ecuador and Colombia, is much more pilose, the leaves tuberculate-scabrous above. *G. apiculata* Schindl., 121, Bolivian, has apiculate anthers, much longer filaments, the inflorescence subsessile. *G. boliviana* Morong, 121, imperfectly known, has smooth leaves, very prominent stamens. F.M. Neg. 3553.

Cajamarca: Shady brook edge, Chugur, 2,700 meters, *Weberbauer 4087*, type.—Cuzco: Damp ravines, 2,500 meters, Pillahuata, *West 7090* (det. Johnston).

Gunnera peruviana Macbr. Field Mus. Bot. 11: 31. 1931.

Large plant, the ligules linear, remotely and spinulosely dentate; petioles about 3 dm. long, like the leaves not at all spinescent but more or less pilose with spinuliform trichomes, finally glabrous; leaves conspicuously bullate-rugose and strongly scabrous above, scarcely tuberculate, rotund-cordate, the smaller about 3 dm. wide and mostly prostrate or ascending, the larger erect, very shortly 5–7-lobed, the lobes broadly rotund-ovate, nearly entire, only repand-undulate and very minutely denticulate; inflorescence sessile or nearly so, densely spinulose-pilose, nearly oblong, about 3.5 dm. long, the remote spreading branches often 5–6 cm. long; bracts persisting, conspicuous, 1–2 cm. long, glabrous but irregularly spinulose-dentate, narrowly ovate-lanceolate, long-acuminate, scarcely or not at all dilated apically; sepals not seen; ovary subglobose.—Largest leaves 0.5 meters across (Stork & Horton). Probably this is *G. scabra* R. & P. as to Muña specimen, not as to description, plate or Chilean material, which is *G. chilensis* Lam., a species with dense inflorescence, deeply, narrowly lobed and acutely serrate leaves. The Colombian *G. manicata* Linden, 122, has coarsely crenate leaf margins, the Chilean *G. Berteroi* Phil, 123, coarsely serrate ones.

Huánuco: Wet shrubby slopes, Tambillo, near Panao, *3583*, type. Muña, *Ruíz & Pavón.* In ravines, Carpish, *Stork & Horton 9903* (det. Standley).

Gunnera rheifolia Schindl. Pflanzenreich IV. 225: 121. 1905.

Petioles stout, 4 dm. long, essentially glabrous and smooth; leaves apparently 7–9-lobed to the middle, the lobes somewhat acutely lobulate, the margins all rather equally and coarsely crenate, the thick nerves on both sides with a few stout trichomes, otherwise glabrous but a little scabrous, smooth or not prominently areolate; peduncles scattered-pilose or glabrous; inflorescence very densely thyrsoid, little narrowed to apex, about 2 dm. long, 5 cm. wide, nearly glabrous, certainly much exceeding the leaves; primary bracts extremely elongate, gradually nearly filiform at tip, scattered-pilose; branches (fruiting) stout, suberect-spreading, floriferous nearly to base, to 3 cm. long; fruit globose, glabrous and smooth, sessile, about 2 mm. thick.—Very probably Chilean. F.M. Neg. 3556.

Peru(?): Without data, *Dombey 924*, type.

2. LAUREMBERGIA Berg

Branched glabrous or pilose herbs with ligneous creeping rhizomes, the flowers minute, the female sessile. Calyx lobes 4, the tube 8-nerved. Petals, at least in male flowers, 4. Stamens 4, 8 or none. Ovary early 4-celled. Styles 4 or none, the stigmas plumose. Fruit composed of minute nutlets, more or less united.

Laurembergia tetrandra (Schott) Kanitz in Mart. Fl. Bras. 13, pt. 2: 378. 1882; 74. *Haloragis tetrandra* Schott ex Spreng. Syst. 4: App. 405. 1827.

Stems creeping-ascending, sometimes several dm. long, minutely if at all pilose; leaves more or less alternate, linear-lanceolate to subobovate, rounded or if acuminate usually obtusely, entire or 1–2-dentate, to 15 mm. long, 6 mm. wide; flowers crowded in the axils, the pedicels to about 6 mm. long, 1–3 hermaphrodite, 4-merous, the petals 1.2 mm. long, lacking in the remaining sessile flowers; fruit 4-nerved, 8-costate, the 3–4 parts more or less confluent.—Said to be native to Africa but now widely distributed in South America.

Peru (probably). Africa; Venezuela and Brazil.

3. MYRIOPHYLLUM [Ponted.] L.

Aquatic or subaquatic, the emersed leaves often pinnately parted, serrate or entire, linear to suborbicular. Flowers often solitary in the axils, usually hermaphrodite or monoecious, 4-merous or rarely dioecious and 2-merous. Calyx lobes caducous, rarely lacking. Petals cucullate. Stamens 8 or 4, the filaments long, the anthers broadly linear. Ovary 4-celled, 4-ovuled, the fruit 4-parted.

Myriophyllum elatinoides Gaud. Ann. Sci. Nat. 5: 105. 1825; 91. *M. titikakense* Remy, Ann. Sci. Nat. sér. 3. 6: 352. 1846.

Aquatic, the emerging flowering branches to 1 meter long, the rather thick emersed leaves oblong or broader, obtuse, at least some of them serrate or entire, 5–10 mm. long, 2–6 mm. wide, the immersed 5–9-pinnate, the capillaceous divisions 6–15 mm. long, all verticillate; flowers sessile, solitary in the leaf-axils, normally hermaphrodite; bractlets 2, often crenate, exceeding the fruit, this ovoid, 4-parted, not tubercled; calyx tube 4-sulcate, papillose-punctate; petals 2.2 mm. long; styles 4, stigmas capitate.—*M. spicatum* L., widely distributed, has all the floral leaves entire. Illustrated, Pflanzenreich l.c. 92.

Lima: Río Blanco, *679; Killip & Smith 21765.*—Junín: Near Huancayo, *Soukup 2942.*—Cuzco: Sacsahuamán, *Herrera; Vargas 2169.*—Puno: Pool on puna, *Pennell 13425.* Lake Titicaca, (*D'Orbigny,* type, *M. titikakense*)*; Soukup 835; Meyen.* Patagonia to Mexico; New Zealand; Tasmania. "Chinquil," "chchinqui" (Herrera).

ARALIACEAE. Ginseng Family

Woody plants or sometimes perennial herbs, sometimes scandent epiphytes. Leaves rarely opposite, simple, pinnate or digitate, rarely estipulate, the stipules usually adnate, sometimes connate and produced into a more or less obvious ligule. Flowers hermaphrodite, polygamous or dioecious, actinomorphic, rarely pseudoracemose, usually in heads or umbels, these solitary or variously disposed. Pedicels, if present, continuous or articulate. Calyx superior, entire or denticulate. Petals 5 (3–10), valvate or slightly imbricate, often free, the distinct stamens usually as many and alternate with them, inserted on a disk, the 2-celled anthers longitudinally dehiscent. Ovary inferior, 1–many-celled with as many styles, these free to connate, 1 pendulous ovule in each cell. Fruit baccate or drupaceous, the seeds solitary in pyrenes, the endosperm copious.—Harms, Natürl. Pflanzenfamilien 3, Abt. 8: 17–23. 1894, discussed in detail the generic divisions of the family. The accepted generic groups with which these merge through connecting species and their distinction is scarcely natural, since the association of the characters is so variously concomitant. I acknowledge my indebtedness to the work of A. C. Smith in North American Flora, 28B. 1944. The generic key is primarily for the species described from Peru. Considerable material was not available to me in time for comparison in the preparation of the final draft, especially for *Dendropanax*, as it was sent to me mixed with other (and later) families.

Ginseng and Sarsaparilla, of ancient medicinal repute, English Ivy (*Hedera helix* L.), and the striking *Aralia* or *Fatsia* of Taiwan, popular in horticulture for background effects, are perhaps the best known plants in this family, which has many ornamental Peruvian species worthy of domestication.

In Amazonian Peru species of the Madagascar genus *Polyscias* (*Nothopanax*) are grown, particularly for hedges; they are woody evergreens with the foliage of *Aralia* but the petals are white; Llewelyn Williams observed (and made specimens of) four species in Loreto, *P. Guilfoylei* (Bull.) Bailey, this also at Tarapoto, the pinnate leaves with leaflets acute at base; *P. Balfouriana* (Hort.) Bailey, similar but the leaflets subcordate-suborbicular; and two species with at least bipinnate leaves, *P. fruticosa* (Miq.) Harms (also at Tarapoto), the leaflets broad, and *P. filicifolia* (Moore) Bailey, the narrow leaflets greatly elongate. Williams noted that the native name for these hedge plants was "alegria," whether from the standpoint of the plant or the grower not stated.

Petals slightly imbricate in bud; leaves pinnate or ternate, the leaflets not entire....................................1. *Aralia.*

Petals valvate; leaves simple or palmately divided.

Flowers in heads, usually polygamo-dioecious, usually sessile, sometimes only male pedicelled; leaves in Peru rarely palmately divided to base and segments subpetiolulate; ligule never obvious; styles 2–10..................2. *Oreopanax.*

Flowers polygamo-monoecious or hermaphrodite, often umbellate, usually pedicellate; leaves ordinarily palmately divided into petiolulate leaflets, in some species entire or lobed, ligule then not obvious and flowers rarely sessile; ligule most often obvious, especially when flowers in heads.

Styles 2 (–3) as ovary cells and ovules; ligule small; leaves palmately divided; flowers in Peru in large open panicles. 3. *Didymopanax.*

Styles (3–) 5–9 usually 5 as ovary cells and ovules; ligule obvious or leaves simple.

Petals more or less coherent; ligule small to well developed; leaves compound........................4. *Schefflera.*

Petals distinct; ligule not obvious; leaves simple.
5. *Dendropanax.*

1. ARALIA [Tourn.] L.

Herbs, shrubs or trees with pinnately or ternately compound leaves, the leaflets serrate, and with umbellate flowers, the umbels 2 or more, often corymbed or in racemes. Stipules binate, usually inconspicuous. Pedicels often enlarged apically or the bractlets there cupulate. Flowers polygamo-monoecious, usually 5- (4–6) merous, the calyx lobed or denticulate, the petals narrowly imbricate in bud, shortly inflexed at tip. Disk fleshy, slightly raised at margin, the 4–6 styles sometimes connate basally. Ovary wall usually fleshy as the sharply angled fruit, the seeds as many as the styles.

Aralia soratensis March. Bull. Acad. R. Sci. Belg. sér. 2. 47: 75. 1879.

Similar to *A. Weberbaueri* which perhaps may prove to be a variety but the heads are 25–45-flowered, pedicels 4–6 mm. long.—Otherwise the plants of Peru seem to be essentially the same, and connect, as observed by Harms, the genera *Aralia* L. and *Pentapanax* Seem. of Argentina, the latter with styles completely connate.

Peru (cf. note above). Bolivia.

Aralia Weberbaueri Harms, Repert. Sp. Nov. 15: 254. 1918.

Glabrous, with ample bipinnate leaves, the larger 3 dm. long or longer on petioles at least a third as long and with 1–2 divaricate pinnae each with 3–7 beautifully caudate-acuminate broadly ovate membranous crenate-serrulate leaflets, rounded at base, 5–9 cm. long, 2.5–4 cm. wide, on petiolules 5–15 mm. long; panicle 1–2.5 dm. long with a few scale-like bracts on the peduncles and at the base of the racemose umbels, these with 5–10 globose acutely 5-angled fruits 4–6 mm. across on pedicels 5–10 mm. long; styles 5, connate nearly to the middle or even above, stellately divaricate or reflexed.—Tall shrub or small tree of rocky green formation.

Huancavelica: Left valley wall of Río Huarpa, 2,500 meters, *Weberbauer 5668*, type.—Apurimac: Prov. Andahuaylas, *Weberbauer 5840* (det. Harms); *Stork & Horton 10663.* Curahuasi, Prov. Abancay, *Vargas 9149.* "Maqui-maqui."

2. **OREOPANAX** Dcne. & Planch.

Character in general that of *Schefflera* but the petiole ligule not obvious or at least not conspicuous, the flowers regularly sessile and in heads (unless the staminate), 4–6 usually 5-merous, commonly polygamo-dioecious. Styles in male flowers 1–2, in female 2–10, free or little connate, the ovary with as many cells. Fruit subglobose or ellipsoid, the styles often caducous, the calyx persistent, the seeds as many as the cells or fewer, endosperm ruminate.—Genus apparently a part of *Schefflera* as to historical relationships but may be retained for convenience. The leaves are variously palmately divided, rarely pinnately, to lobed or toothed, the pubescence often tomentose and conspicuous. As in *Schefflera* the number of species will probably be found to be fewer when the range of variation in the characters now used for discrimination is known; certainly the validity is doubtful in many instances, but little material has been made available to me. It is unfortunate that, for reasons of expediency, the probably variable leaves have to be used to key out the many species names proposed.

Leaves more or less divided, at least most of them (see also *O. cissoides*).
  Leaf divisions extending nearly or quite to base, at least for many leaves.
    Leaflets narrowed to a petiolar base.
      Inflorescence dense, glabrate; leaves glabrous. *O. stenodactylus.*
      Inflorescence open, pubescent, as leaflets at base. *O. Williamsii.*
    Leaflets sessile, not pseudo-petiolulate.
      Leaf segments or leaflets 5–9.
        Leaves, at least the lower, parted almost to base. *O. ischnolobus.*
        Leaves parted to slightly above the base. . . . *O. sandianus.*
      Leaf segments 2–5, or some leaves entire.
        Leaves in part entire or bilobed or biparted. *O. allocophyllus.*
        Leaves 3–5-parted. . . . . *O. Mathewsii.*
  Leaf divisions not extending to base of blade for any leaves (as known).
    Divisions several times longer than wide. . . . . *O. argentatus.*

- Divisions broadly ovate, about twice longer than wide.
  - Margins entire or obscurely and remotely dentate or undulate.
    - Leaf lobes acute or very shortly acuminate.
      - Inflorescence branches 1.5 mm. thick....... *O. oroyanus.*
      - Inflorescence branches 3.5 mm. thick..... *O. Raimondii.*
    - Leaf lobes obviously acuminate.
      - Leaves villous-tomentose beneath, the lobes caudate. *O. cuspidatus.*
      - Leaves sometimes glabrate but lobes not caudate.
        - Leaves villous-tomentose beneath....... *O. Macleani.*
        - Leaves soon glabrate beneath........ *O. polycephalus.*
  - Margins (at least some lobes) clearly and rather evenly denticulate or incised (cf. *O. Macleani*).
    - Margins merely denticulate.
      - Indument villous tomentose; leaf lobes caudate. *O. cuspidatus.*
      - Indument mostly short or soon deciduous; leaf lobes shortly acuminate.
        - Leaves reddish lepidote-puberulent beneath. *O. iodophyllus.*
        - Leaves early canescent, later glabrous or nearly beneath. *O. Weberbaueri.*
    - Margins incised........................ *O. ecuadorense.*
- Leaves entire, or most of them, rarely dentate or some lobulate or with 1–2 much smaller lateral leaflets.
  - Leaves 2–3.5 (4) cm. wide, rather oblong-lanceolate.
    - Margins entire or in any case not subspinose.
      - Indument mostly or all lacking in age on leaves beneath.
        - Leaves oblong-linear.................... *O. stenophyllus.*
        - Leaves ovate-lanceolate or oblong-lanceolate.
          - Panicles branched.................... *O. pariahuancae.*
          - Panicles simple............................ *O. Ruizii.*
      - Indument densely silvery lepidote beneath. *O. argentatus, O. Candamoanus.*
      - Indument early red-floccose on leaves beneath..... *O. Ruizii.*
    - Margins subspinose-denticulate................ *O. aquifolium.*
  - Leaves mostly or all wider, in any case more or less ovate or elliptic.

Peduncles shorter than or about equaling the glabrate heads (species imperfectly known [cf. *O. Ruizii*], doubtfully distinct).

  Leaves glabrous or nearly, even beneath.

    Leaves all (always?) entire.

      Heads of 5-petaled flowers all panicled . . . . . . *O. capitatus.*

      Heads of 4-petaled flowers in part spicate . . . . *O. divulsus.*

    Leaves in part more or less lobed . . . . *O. cissoides.*

  Leaves more or less permanently pubescent beneath.

    Indument loose or deciduous, the prominent leaf veins soon evident (type) . . . . *O. Pavoni.*

    Indument dense on leaves beneath.

      Indument pale, stellate puberulence . . . . *O. artocarpoides.*

      Indument reddish-tomentose . . . . *O. Jelskii.*

Peduncles elongate or 2–3 cm. long, often longer than the villous or lanate (always?) heads.

  Style 1 or 2 and high-connate (known); heads villous. *O. gnaphalocephalus, O. apurimacensis.*

  Styles 5–7; heads not described fully . . . . *O. Lechleri.*

Oreopanax allocophyllus Harms, Repert. Sp. Nov. 23: 299. 1927.

Shrub, the younger parts including the panicles evanescently tomentulose, the leaves exceedingly variable, some of them entire, some with a more or less developed lobe on one side, others bilobed and still others biparted, the divisions ovate-lanceolate, acuminate, remotely serrate-denticulate, chartaceous or coriaceous, the undivided 13–17 cm. long, 7–10 cm. wide, the trilobed to 2.5 dm. long, their lobes 4–9 cm. broad; peduncles of the heads 3–15 mm. long; peduncular bracts 1–2 mm. long, the floral squamiform; petals 5, acute, glabrous or nearly, 2.5 mm. long; style simple(?).—As the well-chosen name indicates, the species is remarkable in the variety of leaves on the same branch. F.M. Neg. 3494.

Junín: Valley of the Río Masamerich, 3,200 meters, *Weberbauer 6680,* type.

Oreopanax apurimacensis Harms, Notizbl. Bot. Gart. Berlin 11: 288. 1931.

Branchlet tips, peduncles and panicles including the heads densely and loosely villous, the simple subentire or remotely and irregularly dentate (or even sublobulate) leaves villous puberulent beneath; petioles becoming glabrate, 3–7 cm. long; leaves ovate to oblong, subtruncate to narrowly rounded or emarginate at base, acuminate, 9–15 cm. long, 5–8 cm. wide, 3–5-nerved from base; bracts at base of peduncles lanceolate, the lowest nearly 1.5 cm. long; peduncles of the heads 2–3 cm. long, the heads oblong-globose, 1–1.5 cm. long; floral bracts linear or oblanceolate, 5–6 mm. long, villous apically as the corollas.—Number of styles not observed. Distinctive among simple-leaved species in the long peduncles and woolly heads (Harms). F.M. Neg. 18175.

Apurímac: Prov. Abancay below Lambrana, *Raimondi,* type.

Oreopanax aquifolium Harms, Bot. Jahrb. 42: 156. 1908.

Branchlets rather stout, erect or ascending, deciduously more or less stellate-villous as the petioles, these only 3–7 mm. long; leaves simple, 1-nerved, oblong or lanceolate, obtuse or somewhat rounded at base, narrowed to an acute or acuminate tip, this often with 1–3 (5) teeth or little lobes, 2.5–6 cm. long, 7–18 mm. wide, coriaceous, glabrous above or the midnerve puberulent, the reticulate veins impressed, some scattered trichomes beneath; heads many-flowered, 5–8 mm. thick, usually 5–11 in a raceme on peduncles 5–12 mm. long; interfloral bracts villous; calyx with ovary obliquely obconic, attenuate at base, glabrous; petals 5, stellate pubescent without; style solitary, simple, subulate.—Flowers brownish without, pale yellow within (Weberbauer). The subspinose teeth of the leaves recall *Ilex aquifolium; O. ilicifolius* March. of Bolivia has 3–5-nerved leaves; *O. grosseserratum* Rusby, Bull. N. Y. Bot. Gard. 4: 367. 1907, also Bolivian, has all of the leaf margin serrate. F.M. Neg. 3495.

Huánuco: Near Monzón, 3,400 meters, *Weberbauer 3350,* type; 253.

Oreopanax argentatus (HBK.) Dcne. & Planch. Rev. Hort. sér. 4. 3: 108. 1854. *Aralia argentata* HBK. Nov. Gen. & Sp. 5: 4. *pl. 414.* 1821.

Branches terete, glabrous; leaves sometimes entire, these oblong-lanceolate, acuminate, acute at base or with a terminal or subterminal tooth or lobule, often 1 dm. long or longer, 3–4 cm. wide, sometimes 2–3-parted at apex and remotely serrate, the intermediate larger, all glabrous above, silvery lepidote beneath, subcoriaceous, reticulately 3–5-nerved, the divisions when present subacuminate; panicles sessile, about 1 dm. long or longer, branches few, the racemose heads of flowers about 5 mm. thick, globose, lepidote-hirtellous; bracts subrotund; calyx entire; petals ovate-oblong-acute, lepidote without; filaments glabrous; styles 5, short, connivent, the stigma simple.—Species is affine *O. Sprucei* (Harms), the leaves divided, about a cm. long, the lobes ovate; *O. Rosei* Harms, Notizbl. Bot. Gart. Berlin 11: 290. 1931, of Ecuador is similar in pubescence. The species may be variable enough to include the Sawada specimens with leaves divided two-thirds, the oblong-lanceolate divisions entire, acuminate, the gray tomentosity deciduous. F.M. Neg. 37055.

Huánuco: Pampayacu, *Sawada 31* (det. Harms, "probably"). Colombia.

Oreopanax artocarpoides Standl. Field Mus. Bot. 17: 205. 1937.

Stout branchlets, petioles (to 1 dm. long) much dilated at base and axillary monocephalous peduncles (5–6 mm. long) minutely stellate-tomentulose or glabrate; leaves lanceolate-oblong or oblong-ovate, rounded or truncate at base, gradually narrowed to acute or obtuse tip, drying lustrous, yellowish above and glabrous unless the slightly stellulate midnerve, paler and densely stellulate puberulent beneath, 5-nerved from base with about 10 very irregularly ascending-suberect lateral nerves, the rather prominent veins laxly reticulate; heads globose-ovoid, 3–4 cm. long, 3 cm. thick, broadly rounded apically; bracts little longer than flowers, densely brown tomentose at tip; fruit glabrous, 1 cm. long, apically truncate.—After author, who suggested no relationship; it seems very near one or the other of the imperfectly known species as indicated in the key, but type not seen; the Peruvian specimen seems to have had several styles, but it suggests strongly *O. Pavoni* as interpreted by authors, maybe not as to type.

Cuzco: Pauticalla Pass, 3,600 meters, (*Cook & Gilbert 1843*, det. Killip). Bolivia. "Calasta."

Oreopanax Candamoanus Harms, Bot. Jahrb. 42: 155. 1908.

Branchlets finally glabrescent; petioles 2–5 cm. long, lepidote pubescent or puberulent; leaves simple, oblong to broadly lanceolate, broadest just above the obtuse or acute sometimes 3-nerved base, gradually narrowed to the acute apex, 6–9 cm. long, 2.5–3.3 cm. wide, coriaceous, glabrous above, rather silvery beneath with a dense appressed lepidote pubescence; panicles branched, lepidote-stellate-villous-puberulent, 9–13 cm. long, the mostly 10-flowered more or less racemose heads subglobose, about 4 mm. thick, on peduncles 4–7 mm.

long; petals 5, sparsely puberulent; ovary glabrous, 5-celled, the 5 styles connate below.—Commemorates the Peruvian president Candamo. Resembles *O. avicenniaefolius* (HBK.) Dcne. & Planch., which, however, has the leaves broadest at about the middle (Harms); this difference, slight as it is, at least as to type, is definite. A shrub 5 meters high. F.M. Neg. 3502.

Cajamarca: Near Huambos, 3,000 meters, *Weberbauer 4161*, type; 260.

Oreopanax capitatus (Jacq.) Dcne. & Planch. Rev. Hort. sér. 4. 3: 108. 1854. *Aralia capitata* Jacq. Enum. Pl. Carib. 18. 1760; Sel. Stirp. Amer. Hist. 89. *pl. 61.* 1763.

Openly branched tree several to 20 meters tall, sometimes supported or apparently pseudoparasitic, the simple entire leaves crowded at the branchlet-tips, these 4–8 mm. thick; petioles 5–12 cm. long, abruptly short-dilated at base; leaves ovate-elliptic or obovate, acuminate, cuneately rounded or occasionally subcordate at base, parchment-like or firm-membranous, glabrous, nearly a dm. (or to 2) long, 5–13 cm. wide, the nerves 3, the reticulate veins rather prominent both sides; heads, both male and female, in moderately diffuse panicles, the former 20–50-flowered, the latter (as the hermaphrodite) fewer-flowered, 5–8 mm. thick or in fruit to 12 mm.; petals 5, elliptic or ovate, pellucid, 1–3-nerved; styles in male flowers 2, free, filiform, in the other flowers 5–12, free and recurving; fruit globose, 3–5 mm. thick, sulcate or rugose in drying.—Determinations by Harms. My collection was from a very open straggling tree; Tessmann's was from a liana-shrub 15 to 25 meters high, the stem 2 dm. in diameter. *Weberbauer 7914*, a 6-meter shrub with clearly cuneate broad leaves, is doubtful.

La Libertad: Valley Mixiolo, 2,000 meters, *Weberbauer 7047*.—Huánuco: Río Pozuzo, 1,000 meters, *Weberbauer 6771*. Yanano, *3716*.—Loreto: Florida, Río Putumayo, *Klug 2329* (det. Standley). Mouth of Río Santiago, *Tessmann 4513; 4604*.—Cuzco: Lares Valley above Mantoc, Prov. Calca, *Weberbauer 7914* (det. Harms, with query). Urubamba Valley, *Weberbauer 5052*. Brazil, to Colombia and the West Indies.

Oreopanax cissoides Harms, Notizbl. Bot. Gart. Berlin 11: 484. 1932.

Allied to *O. capitatus* and in general similar but the petioles 2–12 cm. long, the leaves 7–12 cm. long, 4–10 cm. wide, commonly ovate or broadly ovate or if lobed suborbicular and in this case 3-lobed or with 1 lateral lobe, with many intermediate forms, the margin sometimes irregularly serrulate; heads numerous, sparsely puberulent.—The name of course refers to the ivy-like leaves.

Cajamarca: Between Chota and Cutervo, *Raimondi 3481*, type; also near Chota, *Raimondi*. "Maqui-maqui."

Oreopanax cuspidatus Harms, Bot. Jahrb. 42: 158. 1908.

Branchlets, leaves beneath and ample terminal panicles densely villous-tomentose with more or less rusty trichomes; petioles 2–3.5 dm. long; leaves 5–7-nerved from base and palmately as many, lobed two-thirds to three-fourths the length, this 8–35 cm., coriaceous, remotely stellate especially on the nerves above, the lobes oblong or often lanceolate, entire, irregularly serrate or with 1–4 lobules; panicle branches 1–2 dm. long; heads globose, 6–8 mm. thick, villous, racemose or subverticillate on peduncles 1–2 cm. long; calyx stipitate, glabrous; petals 5 or 6, villous without; styles 2, connate at base or nearly to tips, the conical disk sulcate.—Distinguished by the author from *O. platanifolius* (HBK.) Dcne. & Planch. by the long-acuminate leaf lobes. Shrub to 6 meters tall. Negative print not seen by me. F.M. Neg. 3506.

Cuzco: Below Yanamanche, 3,300 meters, *Weberbauer 4982*, type; 244.—Puno: Near Limbani, *Metcalf 30494*, ex char.

Oreopanax divulsus March. Bull. Acad. R. Sci. Belg. sér. 2. 47: 90. 1879.

Glabrate shrub with slender petioles about as long as the leaves, these ovate-elliptic or ovate-oblong, a little cordate at base, attenuate at tip into a narrow triangular acumen, entire, subcoriaceous, 7–15 cm. long, 2.5–6 cm. wide, 5–9- (rarely 7-) nerved, prominently reticulate especially on the paler under-surface; male heads in terminal compact panicles 1–2 dm. long, longer than the leaves, the slender branchlets somewhat pubescent, the lower heads 3–4 mm. thick, 15–20, the upper 6–12-flowered or with 3–7 sessile flowers arranged to simulate a spike; peduncles slender, 5–10 mm. long, flowers tetramerous; bractlets ciliate, subvillous about the base; calyx tube obconic, corolla hemispheric, the petals ovate-elliptic, membranous, exceeded by the filaments; style 1, the disk concave, glabrous.—The narrower leaves, the upper spiciform heads and the tetramerous flowers separate this species from *O. capitatus* (Marchal). Characters doubtful. F.M. Neg. 37055.

Amazonas: Chachapoyas, *Mathews*, type.

Oreopanax ecuadorense Seem. Journ. Bot. 3: 272. 1865.

Petioles 1.5 dm. long or longer, equaled by the ovate 3-parted leaves, these thick-coriaceous, glabrous above, ashy-tomentose beneath, the divaricate ovate-oblong lobes acuminate, obtuse at base, 3-nerved, irregularly and coarsely dentate; rachis and peduncles tomentose; male heads ovate or oblong; petals 4, ovate, acuminate, tomentulose without (after Seemann).—Type from above Guayaquil by "Pavón," actually obtained by the artist of the expedition, Tafalla. *Herrera 1941* (not seen), from Urubamba, Cuzco, was reported as this species or affine.

Peru (possibly). Southwestern Ecuador.

Oreopanax gnaphalocephalus Harms, Repert. Sp. Nov. 15: 247. 1918.

Branchlets toward the tips, leaves beneath, and elongate, simple panicles, these to 2.5 dm. long, densely tomentose-villous with stellate trichomes; petioles 7–20 cm. long; leaves broadly lanceolate to ovate, rounded or slightly emarginate at the 3–5-nerved base, narrowed to the acute or acuminate apex, 12–25 cm. long, 5–13 cm. wide, rigid-coriaceous, entire or sparsely and remotely spinose- or serrate-dentate, glabrous above; peduncular bracts acuminate, the lower about 2 cm. long, the peduncles to 3 cm. long or the upper obsolete; heads densely villous, ovoid, 1.5–2 cm. long or longer, the exserted floral bracts glabrate apically, 6–7 (8) mm. long; flowers to 5 mm. long with 6–7 broadly lanceolate acute villous petals about 4 mm. long; ovary glabrous or nearly; style 1, or if 2 connate to the middle or higher.—Suggests *O. Rusbyi* Britton of Bolivia with smaller subglobose heads, the leaf-pubescence beneath more appressed and lepidote. Type a shrub 2 meters high.

Ayacucho: Along the way from Tambo above Osno to the Río Apurímac, 3,400 meters, *Weberbauer 5661*, type.

Oreopanax iodophyllus Harms, Notizbl. Bot. Gart. Berlin 11: 289. 1931.

Branchlet tips and peduncles, including the heads, densely rusty villous, petioles 6–23 cm. long, finally glabrescent; leaves suborbiculate, nearly one-third 5–7-lobed (or scarcely to the middle), 5–7-nerved from the broadly cordate base, only the larger nerves prominent beneath, 14–25 cm. wide, coriaceous, glabrous or nearly above, reddish beneath from the dense appressed lepidote tomentum, usually remotely and unequally spinulose dentate, the lobes deltoid or broadly ovate, acuminate; panicle branches 5–8 cm. long, the peduncles 5–10 mm. long; heads 5–7 mm. long, the floral bracts villous, the flowers glabrous, nearly 2.5 mm. long; style 5-parted nearly to middle; ovary glabrous.—This was referred by Marchal to *O. boliviense* Seem. Journ. Bot. 3: 272. 1865, which has leaves finally glabrous both sides. The size of heads resembles *O. Weberbaueri* but, at least in the Berlin specimen, the leaves were densely stellate-tomentose beneath; it doesn't seem possible that these differences have any genetic basis. F.M. Negs. 3498; 29225.

Huánuco: Muña, *Ruiz & Pavón*, type.

Oreopanax ischnolobus Harms, Repert. Sp. Nov. 15: 250. 1918.

Shrub or small tree to 8 meters high, glabrate, or the younger parts, including the ample branched panicles, puberulent or pubescent-villous; petioles 1.5–3.5 dm. long; leaves palmately 4–8-parted nearly to base (the uppermost 3-lobed or sometimes entire), the lobes narrow or linear-lanceolate, narrowed both ends, acuminate, 7–20 cm. long, 1.5–3 cm. wide, subcoriaceous, glabrous and somewhat lustrous above, merely glabrous or puberulent beneath, the many lateral nerves and reticulate veins conspicuous; bracts at the base of the peduncles, these 5–16 mm. long or obsolete, small, the subglobose or rarely oblong heads 4–8 mm. long, the short bracts nearly suborbicular, pilose; petals greenish, 5-deltoid, acute, 2–2.5 mm. long, pilose without; disk slightly pilose; ovary glabrous; style 1, sometimes obsolete.

Junín: North of Comas, 2,500 meters, *Weberbauer 6614*, type.

Oreopanax Jelskii Szyszyl. Dissert. Classis Math.-Phys. Acad. Litt. Cracov. 29: 227. 1895; Rospr. Akad. Umiej. Krackow. ser. 2. 9: 1895.

Branches, inflorescence, leaves beneath densely ferrugineous-tomentose; petioles 5–7 cm. long; leaves ovate-lanceolate, acuminate, rounded at base, 3-nerved, entire or repand-dentate, coriaceous, rugose above, 8–9 cm. long, 5–6 cm. wide; panicles terminal, exceeding the leaves, 6 cm. long, the heads 5–7 mm. in diam.; flowers hermaphrodite, the narrow scarious bracts about equaling or exceeding the flowers, these in bud elliptic-globose, 4 mm. long, the short calyx obscurely sinuate; petals 5 apiculate; filaments much shorter than anthers; ovary 1-celled (after Szyszylowski).—Affine *O. fulvus* in habit according to the author. Harms has distinguished an Ecuadorian variant as *O. iotrichus*, Notizbl. Bot. Gart. Berlin 12: 694.

1935, the leaves oblong-ovate to obovate or oblong-lanceolate, densely rusty-villous beneath, 3-nerved from base, the heads somewhat larger; both plants similar to *O. Pavoni*.

Cajamarca: Cutervo, *Jelski 313*, type; *Raimondi* (det. Harms).

Oreopanax Lechleri Seem. Journ. Bot. 3: 271. 1865.

Robust, the branches, petioles, rachises and peduncles rusty tomentose, finally glabrate; leaves ovate-oblong, subcuneate at base, acuminate, about 3 dm. long, a third as wide, entire or here and there a tooth, 5–7-nerved, glabrous above, densely rusty tomentose beneath; fruiting heads about as large as a cherry (*Prunus*), few, long-peduncled; styles 5–7 (after Seemann).—Type locality written by author Gachapata, probably for Agapata or Sachapata.

Puno: Agapata(?), *Lechler 2286*, type.

Oreopanax Macleani Seem. Journ. Bot. 3: 272. 1865.

Branches, petioles, rachises, peduncles and leaves beneath densely villous tomentose; leaves long-petioled, ovate, apically 5-lobed, the ovate triangular lobes acuminate, entire or remotely denticulate, 8-nerved, glabrous above; male heads globose, size of a pea (*Pisum*); petals villous without (Seemann).—Ex. char. this could be the earlier name for one or the other of the apparently similar species, yet, strangely enough, if usually, botanists proposing comparable forms have not—or I have not discovered it—defined this one, and other incompletely described entities.

Peru(?): (*Maclean* in herb. Hook., type).

Oreopanax Mathewsii Seem. Journ. Bot. 3: 272. 1865.

Branches, petioles and rachises rusty tomentose; leaves palmately 3–5-parted, glabrous above, sparsely stellate pubescent beneath, becoming glabrate; male heads in ample panicles; petals glabrate without (Seemann).—This is the same as *O. Pavoni* fide Marchal.

Amazonas: Chachapoyas, (*Mathews*, herb. Bentham, type).

Oreopanax oroyanus Harms, Notizbl. Bot. Gart. Berlin 11: 289. 1931.

Branchlet tips and leaves densely villous, the petioles (these at least 1–1.5 dm. long) and panicles villous puberulent; leaves suborbicular, rounded to emarginate at base and from it 3–9-nerved, coriaceous, glabrous above, 3–7-lobed, sometimes nearly medially (the middle lobe 13–17 or even 25 cm. long), the lobes broadly deltoid or ovate, mucronate or slightly acuminate; panicle branches subumbellate, lax, to 1.5 dm. long, the peduncles 3–10 mm. long; heads racemose, villous, 5–7 mm. thick; bracts at base of flowers rhombic-obovate, villous, 3–3.5 mm. long; styles free, 4 or 5.—*O. platanifolius* (Kunth) Dcne. & Planch. has much larger, often longer heads (Harms). F.M. Neg. 18177.

Junín: Camino de la Oroya, *Raimondi*, type.

Oreopanax pariahuancae Harms, Repert. Sp. Nov. 15: 247. 1918.

Branchlet tips pilose with slender trichomes; leaves lanceolate-oblong, acute at base or narrowed into the petioles, these 3–6 cm. long, acute or acuminate, 6–12 cm. long, 2–4 cm. wide, chartaceous or subcoriaceous, glabrous and somewhat lustrous above, sometimes pilose on the rather prominent midnerve beneath near the base, 1-nerved; panicle branched, puberulent-pilose or -villous, the peduncles 0.5–1.5 cm. long or shorter; heads small; petals glabrous or nearly, 2–2.5 mm. long.—Attains 4 meters. In the related *O. capitatus* the leaves are 3-nerved.

Junín: In evergreen shrubs in the valleys of the Pariahuanca, La Merced, 3,200 meters, *Weberbauer 6532*, type.

Oreopanax Pavoni Seem. Journ. Bot. 3: 272. 1865. *O. Mathewsii* Seem. l.c. fide March. in Mart. Fl. Bras. 11, pt. 1: 252. 1878.

Branches, petioles, rachises and peduncles densely rusty stellate-tomentose; petioles a dm. long or longer, very shortly dilated at base; leaves ovate, acuminate, rounded or subcordate at base, as long as the petioles, usually 7–14 cm. wide, chartaceous to thick coriaceous, early stellate puberulent above, persistently densely rusty tomentose beneath (not in type), entire or rarely remotely repand-dentate, 5-nerved, palmately 3- or occasionally 5-lobed, the middle lobe 8–12 cm. long, 5–7 cm. broad, the veins prominent beneath; male panicles 2–3.5 dm. long, the 20–30-flowered heads about 5 mm. across, congested, the peduncles 3–5 mm. long; petals 4, elliptic, acute, stellate pubescent without; stamens 4; style 1, filiform, elongated.—Cotype material is deciduously and canescently villous tomentose and perhaps the rusty tomentose specimens are another form or species. F.M. Neg. 3518.

Amazonas: Chachapoyas, *Mathews*.—Huánuco: Above Mito, *1566*; *1924* (both det. Harms). Pampayacu and Cassapi, *Poeppig 1059*.

Panao, *Ruiz & Pavón*, type.—Ayacucho: Osno, 2,400 meters, *Weberbauer 5650;* 260.—Puno: Churuhausi, *Soukup 483?* Brazil. "Palo de cchagra," "papaya de monte."

Oreopanax polycephalus Harms, Bot. Jahrb. 42: 157. 1908.

A tree, the branchlets, petioles and ample terminal panicles more or less deciduously villous puberulent or villous; upper petioles 5–10, lower 14–25 cm. long; leaves palmately 5–7-lobed, parted one-third or nearly to the middle, 5–9-nerved, chartaceous, glabrous above, villous puberulent on nerves beneath, cordate or the upper ones rounded at base, ample, from tip of petiole to tip of middle lobe 12–30 cm. long, 7–36 cm. wide, the lobes broadly ovate, cuspidate to more or less acuminate, entire or minutely and remotely dentate; panicle branches 5–25 cm. long; heads racemose on peduncles 5–15 mm. long, subglobose, 3–4 mm. thick, or spicate and 7–9 mm. long with sometimes solitary flowers below the spike; male flowers yellowish white, the bracts villous, the calyx with sterile ovary glabrous, the petals, as stamens, usually 4, deltoid, 1–1.3 mm. long; style 1, simple.—Allied to group of species with similarly small heads: *O. floribundus* (HBK.) Dcne. & Planch., with leaves tomentose beneath; *O. microcephalus* Harms, l.c. 20: Beibl. 49: 68. 1895, leaves silvery beneath, styles 5; *O. obtusilobus* (HBK.) Dcne. & Planch., pubescence lepidote, leaf-divisions obtuse; *O. articulatus* (Willd.) Dcne. & Planch., vein reticulation beneath prominent, the leaf-lobes lanceolate; *O. Schimpffii* Harms, Notizbl. Bot. Gart. Berlin 12: 695. 1935, leaves densely villous beneath, heads only 4–8-flowered, 4–5 mm. thick on peduncles 3–5 mm. long. F.M. Neg. 3520.

Junín: La Merced, 1,000 meters, *Weberbauer 1844*, type; 282.

Oreopanax Raimondii Harms, Notizbl. Bot. Gart. Berlin 11: 290. 1931.

Except for the leaves above densely and softly tomentose or villous-tomentose; petioles 4–15 cm. long; leaves even to the middle 3–5-lobed (middle lobe usually 8–15 cm. long), subtruncate to lightly cordate at base, fleshy coriaceous, glabrous or nearly above, the lobes deltoid or ovate, acute or obtusish, often mucronulate; panicle branches to 1.5 dm. long; heads 5–8 mm. long on short peduncles 4–10 mm. long; floral bracts very broad, nearly obovate, 3 mm. long; petals very villous, 2 mm. long; calyx margin (or disk?) hirsute; styles 5.—Allied to *O. platanifolius* (Kunth) Dcne. & Planch., with larger heads. F.M. Neg. 18178.

La Libertad: Prov. Pataz, camino to Condurmarca, *Raimondi*, type. "Maqui-maqui," "Mano-mano."

Oreopanax Ruizii Dcne. & Planch. ex Harms, Repert. Sp. Nov. 15: 248. 1918.

Shrub or small tree with rather slender deciduously villous (finally glabrous) branchlets and sparsely puberulent simple panicles commonly less than 1 dm. long; petioles pubescent or glabrate, 1–3 cm. long or longer; leaves oblong-lanceolate, acute or obtuse at base, often acute and mucronulate or somewhat acuminate, 5–11 (17) cm. long, 1.5–3 (5) cm. wide, subcoriaceous, glabrous above unless for puberulent midnerve, this impressed, sparsely and deciduously pubescent to glabrate beneath; peduncles 1–2 cm. long; heads subglobose, a cm. long or longer, the bracts deltoid-obovate, scarcely apiculate, villous, 3–3.5 mm. long, the bractlets narrower; petals 5, puberulent; ovary glabrous, the style simple.—The authors listed the name without diagnosis in Rev. Hort. sér. 3. 3: 108. 1854, as well as a similar shrub from Huasahuasi named for the collector Dombey (F.M. Negs. 37507, 3507). From this shrub flows a white and clear gum that completely dissolves in water (Ruíz & Pavón). Determinations by Harms. F.M. Neg. 37508.

Huánuco: Río Pozuzo, 3,600 meters, *Weberbauer 3687.* Muña, *Pearce.* Mito, *3368.* Tambo de Vaca, *4421; 4436.* Panatahuas, near Muña, *Ruíz & Pavón*, type. "Palo de Cchaxac."

Oreopanax sandianus Harms, Bot. Jahrb. 42: 160. 1908.

Rather resembles *O. Weberbaueri* but much less pubescent, merely stellate-puberulent or glabrate and the leaves mostly much more deeply and narrowly divided, the 3–7 divisions oblong-lanceolate; flowers unknown; inflorescence 7–10 cm. long, the branches only 2–7 cm. long with 3–5 subglobose heads mostly clustered toward the ends on peduncles 7–20 mm. long; style simple, short, with 5–6 stellately recurving stigmas.—F.M. Neg. 3521.

Puno: Between Sandía and Cuyocuyo, 2,600 meters, *Weberbauer 896*, type; 237.

Oreopanax stenodactylus Harms, Repert. Sp. Nov. 15: 250. 1918.

Similar to *O. ischnolobus* but the leaves digitately divided to base, the panicle nearly glabrous or only minutely and sparsely puberulent including the bracts and petals, the peduncles 1–2.5 cm. long, the style 1 or 2 and then more or less connate, the disk apparently glabrous.—A 1-meter shrub with yellowish flowers. As in the case of so many forms described as species more collections will be necessary to prove or disprove their stability; many of them, as this plant, seem to be variants, granting any reasonable lack of uniformity within the species concepts.

Ayacucho: Tambo above Osno on way to Río Apurímac, 3,100 meters, *Weberbauer 5590*, type.

Oreopanax stenophyllus Harms, Bot. Jahrb. 42: 157. 1908.

A dioecious shrub with erect branchlets, these as the petioles and leaves deciduously more or less stellate-villous-puberulent; petioles of lower branchlets 3–7 cm. long, those of the upper 3–25 mm. long; leaves simple, 1-nerved, linear-lanceolate, obtuse or even emarginate to acute at base, gradually narrowed to the acute tip, 7–25 cm. long, 9–22 mm. wide; male heads about 7, many-flowered in a terminal stellate villous raceme, subglobose, 7–9 mm. thick on peduncles 4–13 mm. long, the small bracts deltoid; interfloral bracts hirsute; calyx broadly cupulate, subentire, glabrous as the 5 oblong-lanceolate petals; style 1; female heads apical on peduncle 2.5–4 cm. long, 10–13 mm. thick or sometimes 17 mm. long; petals deltoid, 2.5–3 mm. long; stamens 5 or 6, small; ovary irregular, 5- or 6-celled, 4–5 mm. long, the styles free or partly connate at base.—Allied, according to the author, to *O. Mutisianus* (DC.) Dcne. & Planch. of Colombia, with much smaller leaves. F.M. Neg. 3527.

Cuzco: Yanamanche, 3,400 meters, *Weberbauer 4948* (male); *4958* (female), types; 244.—Puno: Sandía, *Soukup 230*.

Oreopanax Weberbaueri Harms, Bot. Jahrb. 42: 159. 1908.

A shrub of about 2 meters, the branchlets, petioles, leaves beneath and panicles deciduously stellate-villous-puberulent, glabrate or glabrous in age; petioles 4–18 cm. long; leaves 5–7-nerved from the cordate base, 3–5-lobed nearly to the middle or more deeply, coriaceous, lustrous and glabrous or nearly above, 1–2 dm. long, 7.5–23 cm. wide, the lobes ovate, acute or acuminate, coarsely and often irregularly serrate; terminal raceme of panicle to 3 dm. long, the peduncles 7–10 mm. long; male heads many, globose, 7–10 mm. thick, the interfloral bracts villous; calyx as sterile ovary glabrous; petals as stamens 5, glabrous, about 3 mm. long; style 1, simple.—Cf. *O. iodophyllus* Harms and note. F.M. Neg. 3529.

Apurímac: Near Ampay, *Vargas 782* (det. Standley).—Puno: Between Sandía and Cuyocuyo, 2,700 meters, *Weberbauer 882*, type; 237. "Upapapaya" (Vargas).

Oreopanax Williamsii Harms, Notizbl. Bot. Gart. Berlin 11: 487. 1932.

Imperfectly collected but the petioles evidently slender, floccose-villous to glabrescent; leaves suborbicular, digitately 8–9-foliolate, the leaflets lanceolate or oblong-lanceolate, gradually narrowed to the short petiolule (5–10 mm. long), acuminate, the upper margins unequally serrulate, the lower entire or nearly, glabrous or a little floccose near base, papyraceous, 13–23 cm. long, 3.5–5 cm. wide; panicles more or less floccose-villous, the divaricate branches slender, 3–7 cm. long or longer; heads 3–4 mm. thick; peduncles 5–8 mm. long, the basal bracts about 4 mm. long, ovate, acuminate, villous, those at the base of the heads similar; ovary glabrous or nearly, the styles in bud free, 5 (always?).—Material young or imperfect but species noteworthy in the completely divided leaves. Williams, Field Mus. Bot. 15: 402. 1936, described the wood from the type, a tree 10 meters or so tall, the columnar trunk with dense spreading crown, the mature black fruit edible.

San Martín: San Roque, 1,350 meters, *Williams 7225*, type; also *7100*. Zepelacio, *Klug 3474* (det. Standley). "Sacha-uvilla" (Williams).

3. DIDYMOPANAX Dcne. & Planch.

Glabrous or pubescent simple-trunked (or branched only at top) shrubs or trees, the leaves simple or usually digitately compound, the basally dilated petioles with small but obvious stipule or ligule. Umbels in ample terminal panicles or racemes or umbellate. Pedicels continuous. Flowers 5-merous polygamo-monoecious and dioecious. Calyx repandly dentate. Petals distinct, valvate. Disk with undulate free margin. Ovary 2-celled, rarely 3 as the styles, these distinct or partly connate, persisting with calyx on the laterally compressed drupaceous fruit, the seeds usually 2.—Intermediate between *Schefflera* and *Oreopanax* and distinct from both mainly by the few styles, clearly a variable character in the family, the generic name probably being a purely arbitrary designation; cf. *Schefflera Harmsii.*

Didymopanax Morototoni (Aublet) Dcne. & Planch. Rev. Hort. 109. 1854. *Panax Morototoni* Aublet, Pl. Guian. 2: 949. 1775.

Aromatic tree sometimes 30 meters tall or even taller, the slender straight trunk sometimes more or less branched above, the ultimate branches about a cm. thick, appressed sericeous as the approximately apical (young) leaves beneath, with a very close yellowish-gray or brownish tomentum; petioles 3–6 dm. long, broadly dilated at base, the petiolules to 10 cm. long or longer; leaflets (7) 10–12, oblong-lanceolate to ovate-elliptic, usually narrowed below the middle, the base itself cordate-rounded to acute, the apex more or less acuminate, rather fleshy and coriaceous, dark green, finally glabrous, at least above, the medial 1.5–3 dm. long or longer, 6–26 cm. wide; lateral nerves 7–12, elevated beneath; umbels 15–40 (3–5) -flowered in terminal sericeous pubescent or glabrate panicles sometimes 4 dm. long, much branched above; pedicels 3–5 (7) mm. long, rarely obsolete; petals elliptic or oblong-lanceolate; styles often connate at base, recurving in fruit, the drupes strongly compressed, broader than long (7–9 mm. wide), usually subemarginate top and bottom or in var. *Poeppigii* (Dcne. & Planch.) March. in Mart. Fl. Bras. 11, pt. 1: 241. 1878 smaller and slightly narrowed above.—Bark smooth with bitter taste; soft wood used for crates and so forth, according to Williams, Field Mus. Bot. 15: 400. 1936, who gives analysis of the wood. Description after Marchal; type from Guiana.

San Martín: Tocache, *Poeppig 1959* (type, var.). Tarapoto, *Williams 5452; Ule 24* pt.—Huánuco: Shapajilla, *Woytkowski 17*.—Junín: San Ramón, *Killip & Smith 24797* (det. Harms); *24889* (det. Standley).—Loreto: Balsapuerto, *Klug 3082*. Iquitos, *Tessmann 3537*.—Río Acre: Near mouth of Río Macauhán, *Krukoff 5530*. Bolivia and Brazil to the West Indies and Mexico. "Sacha-wa" (Williams), "huarmi-huarmi" (Klug).

4. **SCHEFFLERA** Forst.

Sciodaphyllum P. Br. Hist. Jam. 190. 1756. *Actinophyllum* R. & P. Prodr. 51. *pl. 8*. 1794, fide Seemann.

Shrubs or trees, rarely epiphytic, with (in Peru) digitately compound leaves, the leaflets nearly always entire or merely subdenticulate. Stipules connate, the resulting ligule coriaceous, obvious to conspicuous. Umbels or heads in racemes, panicles or sometimes solitary, the pedicels, when developed, articulate. Flowers hermaphrodite or polygamo-dioecious, 5–9-merous. Calyx usually denticulate. Petals free or more or less calyptrately coherent, sometimes so tightly as to appear as one. Stamens as many as the petals. Disk fleshy, the styles connate or free and finally recurving. Ovary thick-walled, the cells and ovule (3–) 5–9. Drupe subglobose, sulcate, topped by calyx limb and styles or column, the seeds sometimes fewer than cells.—The generic name was proposed for conservation by A. C. Smith, Trop. Woods 66: 4. 1941.

S. peruviana Asplund, imperfectly known, is not placed in the key and, ex char., alone could be any one of several species. Since most species proposed are still known only from the original collection it has been necessary to key them in characters which with accumulation of more material may be found to be variable; already there is some indication that such is the case; cf. remarks under *S. acuminata.* There is a habitat photograph of *S. pentandra* (apparently *S. moyobambae*) and related vegetation in Weberbauer (opposite page 276).

Flowers pedicellate.
  Leaflets rounded at tip, sericeous beneath .... *S. Harmsii.*
  Leaflets acute to acuminate.
    Flowering branchlet leaflets 2–4.5 cm. wide.
      Leaflets glabrous or nearly, subabruptly acuminate (*Sciod. Mathewsii*) .... *S. pedicellata.*
      Leaflets, especially the younger, tomentulose beneath, acutely acuminate .... *S. monzonensis.*
    Flowering branchlet leaflets ample, all or mostly much wider than 5 cm.
      Peduncles 1–2 cm. long (species, as known, scarcely distinct).
        Leaflets abruptly caudate acuminate.
          Plants glabrous .... *S. moyobambae.*
          Plants somewhat stellate pubescent .... *S. sandiana.*
        Leaflets acutely acuminate, early villous .... *S. yuncacoyae.*
      Peduncles 2–5 mm. long, many .... *S. minutiflora.*
Flowers sessile.
  Flower heads on slender glabrate or pubescent peduncles at least as long as diameter of heads, these few- (mostly -14) flowered.
    Flowers several, the heads even in fruit scarcely 1 cm. thick; leaves more or less cuneate at base ("species" apparently merging).
      Leaves oblong-lanceolate, the length 3–4 times the width, this 2.6 cm.
        Leaves paler beneath; styles (type) 4.......... *S. Sprucei.*

Leaves subconcolor; style 8 or 9 . . . . *S. microcephala.*

Leaves oblong-elliptic-oblanceolate, the length about two and a half times the width; styles 4–5 (type) or more. *S. Ulei.*

Flowers to about 14, the fruiting heads to 1.5 cm. thick; leaves rounded or merely acute at base . . . . *S. conica.*

Flower heads sessile or the thick or villous peduncles usually not as long as the diameter of the many-flowered heads, or if longer, very villous.

Peduncles, if developed, stout, often short, several mm. thick; leaves usually coriaceous; heads many-flowered.

Leaflets (upper leaves) about oblong, mostly or all only 3–5 (–7) cm. wide.

Styles elongate, connate, conspicuous; leaflets narrowly cuspidate . . . . *S. dolichostyla.*

Styles finally divaricate or short; leaflets shortly broad-cuspidate.

Indument pale, deciduous.

Styles 3–5; leaflets 5–9 . . . . *S. Pardoana.*

Styles 5–7; leaflets 11–13 . . . . *S. Weberbaueri.*

Indument reddish, more or less persisting.

Leaf base rounded . . . . *S. inambarica.*

Leaf base acute . . . . *S. Viguieriana.*

Leaflets (upper leaves) broadly elliptic or, if oblong, ample, all or mostly wider than 6 cm.

Indument reddish, early conspicuous; leaflets oblong-obovate, caudate . . . . *S. Viguieriana.*

Indument pale or fulvous, often early deciduous.

Leaflets apiculate, about twice as long as wide, heavy coriaceous . . . . *S. euryphylla, S. angulata.*

Leaflets caudate, about three times as long as wide, flexible subcoriaceous . . . . *S. pentandra.*

Peduncles slender, sometimes obscured by the flowering heads or by indument; leaves firm-chartaceous. *S. Klugii, S. acuminata.*

Schefflera acuminata (R. & P.) Harms, Pflanzenfam. 3, Abt. 8: 36. 1894. *Sciodaphyllum acuminatum* (R. & P.) Poir. Encycl. 6: 746.

1804. *Actinophyllum acuminatum* R. & P. Fl. Peruv. 3: 74. *pl. 310.* 1802.

Glabrous or glabrate in age, the growing tips, especially the long racemiform panicles, evanescently more or less deciduously tomentulose-villous or only puberulent; petioles often several dm. long, the petioles of the upper leaves 4–5 cm. long, the many (9–13) leaflets, in type, nearly oblong, rarely elliptic or slightly obovate, slightly or scarcely wider than the middle, little narrowed to the rounded or obtuse base, abruptly and acutely caudate-acuminate (acumen about 1 cm. long), often 2–3 dm. long, about 6–9 cm. wide, sometimes much smaller, no doubt also larger, chartaceous, the 20–25 principal lateral nerves and the densely reticulate veins rather prominent both sides; peduncles slender, sometimes 5–6 mm. long or rarely longer, in early flower nearly lacking; heads few-flowered, the globose-conical glabrous corollas almost 3 mm. long, the bracts long-villous; disk elevated; styles and stamens 5.

The Metcalf collection with peduncles to 12 mm. long, heads about 25-flowered, red-villous, especially the panicle, was referred by Killip to *S. inambarica* which perhaps is not distinct; however, it has much stouter peduncles, shortly cuspidate leaves. It is probable that the range of variations in these respects is greater than realized and that there are fewer species. The Cuzco plant seems to be intermediate in characters, or perhaps a new species is concerned. Probably should include *S. Klugii* with leaves more obovate; my collection, as type, from a high-climbing liana, the branches pendent, Killip & Smith's recorded as a tree, 3 meters tall, Weberbauer's as a shrub, 5 meters tall.

Huánuco: Muña, *Ruiz & Pavón*, type. Cuchero, *Poeppig 1627* (distr. as *S. pentandra*). Pampayacu, *Kanehira 232*.—Junín: La Merced (Hacienda Schunke), *5689* (det. Johnston); *Killip & Smith 24522* (det. Standley).—Cuzco: Marcapata, in valley, 1,700 meters, *Weberbauer 7849* (det. Harms).—Puno: Above Santo Domingo, *Metcalf 30650?*

Schefflera angulata (R. & P.) Harms, Pflanzenfam. 3, Abt. 8: 36. 1894. *Actinophyllum angulatum* R. & P. Fl. Peruv. 3: 73. *pl. 307.* 1802. *Sciodaphyllum angulatum* (R. & P.) Poir. Dict. 6: 745. 1804.

Sometimes, at least, arborescent and soon glabrate, a scurfy fulvous or pale puberulence more or less persisting on the elongate panicles and leaves beneath or these glabrous; stipules of the upper leaves to 5 cm. long, the petioles at least 2.5 dm. long, the 7 or more leaflets with petiolules 2–4 cm. long, blades 2–2.5 dm. long, about half as broad, or the smaller leaflets about half as large, all rounded at base, shortly (and broadly) apiculate, rigid-coriaceous, the parallel lateral nerves prominent both sides, the openly reticulate veins lightly obvious above; panicles to several mm. long; peduncles to 1.5 cm. long in fruit, 4–5 mm. thick; heads (fruiting) nearly 2 cm. thick, 2.5 cm. long; disk little elevated, styles short as stamens 4–6 (7); fruits puberulent, sometimes 5 mm. long, 4 mm. thick.—My collection from a large tree, 23 meters tall, the leaves yellowish-green, the heads reddish-green. F.M. Neg. 37506.

Huánuco: Muña, Chaglla and Pillao, *Ruíz & Pavón*, type. Wet rocky montaña, Playapampa, *4893* (det. Harms).

Schefflera conica (R. & P.) Harms, Pflanzenfam. 3, Abt. 8: 36. 1894. *Actinophyllum conicum* R. & P. Fl. Peruv. 3: 74. *pl. 309*. 1802. *Sciodaphyllum conicum* (R. & P.) Poir. Dict. 6: 746. 1804.

Single stalked, sparsely leafy and glabrous in fruit, sometimes about 3 meters high, only the younger parts evanescently pubescent; upper petioles to about 2.5 dm. long, the oblong mostly 7–10 leaflets broadly rounded to the shortly or scarcely acute base, abruptly, narrowly and acutely short-acuminate, often about 1.5–2 dm. long, 5–6 cm. wide, obviously nerved and reticulate-veined both sides; panicles 3 dm. long or longer; peduncles 5–10 mm. long; flower heads about 7–9 mm. thick, in fruit about 1.5 cm. in diameter, the fruits glabrous, white, 6 mm. long, 5 mm. thick with 5 or more stigmas, or, according to Ruíz and Pavón, 7–11.—May be near *S. acuminata*. In this shrub (scandent in type), as in other species of its genus, there are found drops of white and clear gum that dissolve in water (Ruíz & Pavón). F.M. Neg. 26158.

Huánuco: Pillao and Chacahuasi, *Ruíz & Pavón*, type. Huacachi, near Muña, *4119* (det. Johnston).

Schefflera dolichostyla Harms, Bot. Jahrb. 42: 152. 1908.

To 5 meters high, the petioles (12–14 cm. long), the petiolules (2–4 cm. long) and the panicles (2–2.5 dm. long) more or less rusty-puberulent, glabrate in age; stipules 5 cm. long or longer; leaflets 5–7, oblong, obtuse or acutish at base, abruptly, shortly and narrowly acuminate, 8–19 cm. long, 3–5 cm. wide, rigid-coriaceous, glabrous and lustrous above, densely pale rusty- or reddish-tomentose beneath; racemose heads (the lanceolate-bracted peduncles 4–7 mm. long) subglobose, 8–12 mm. thick; ovary rusty villous, 4–5-celled, the disk nearly plane, the styles long-exserted, the stigmas divaricate. —F.M. Neg. 3475.

Puno: In thickets, mostly bamboos, 3,000 meters, Sandía, *Weberbauer 735*, type; 240.

Schefflera euryphylla Harms, Bot. Jahrb. 42: 151. 1908.

A glabrous or nearly glabrous tree 15 meters high with ample coriaceous leaves; stipules vaginate, 2.5–3 cm. high; petioles minutely and sparsely puberulent, 2 dm. long or longer, the petiolules 1.5–4 cm. long; leaflets 7–9, broadly elliptic or somewhat obovate, rounded or slightly cordate at base, apparently only a little acuminate, 14–22 cm. long, 9–12 cm. wide, the 10–12 lateral nerves prominent beneath; panicles about 3 dm. long, puberulent or glabrate, the very shortly peduncled or subsessile heads racemose, subglobose or ovoid, 15–23 mm. long; ovary angled, subsericeous, 5–6-celled, the same number of styles little immersed, connate base, finally spreading.—Notable for its extraordinarily broad leaflets (Harms). F.M. Neg. 3476.

Junín: Near Huacapistana, 2,700 meters, *Weberbauer 2288*, type; 251.

Schefflera Harmsii Macbr., nom. nov. *Didymopanax Weberbaueri* Harms, Bot. Jahrb. 42: 161. 1908, not *S. Weberbaueri* Harms.

Branchlets appressed subvelvety puberulent; petioles 7–21 cm. long, the petiolules 1–4 cm. long; leaflets 4–6, oblong to obovate, mostly acute at base, rounded and slightly emarginate and mucronulate at tip, 4–12 cm. long, 2–4.5 cm. wide, thin-coriaceous, glabrous above or a little puberulent on the impressed nerves, strikingly golden or coppery sericeous beneath; panicles 5 or more at the branchlet tips, on angled puberulent peduncles 1.5–3.5 dm. long, umbellulate, the 5–7 radii 3–5.6 cm. long, finally nearly equal, the medial often somewhat thicker and more densely (20–25) flowered; pedicels 5–7 (10) mm. long, continuous with the clavate 5-celled ovary and like it early golden sericeous, later appressed puberulent; calyx minutely 5-dentate, the deltoid acute petals sericeous without, about 2 mm. long; ovary 5-celled; disk conical, crowned with the 4–5 short stigmas, the broadly connate styles recurving in the young puberulent or nearly glabrous 4- or 5-angled fruit.—To 7 meters high; species comparable with the Brazilian *D. anomalum* Taub. l.c. 17: 511. 1893 and *Sciodaphyllum japurense* Mart. & Zucc., the former with smaller acuminate leaflets, 4–5-celled ovary, the latter with more or less acute leaflets and 3–5-celled ovary. The three species show that no sharp distinction exists between these genera and *Schefflera* (Harms). Since *Didymopanax* is actually a natural part of *Schefflera* this peculiarly Peruvian species may be classified now where *D. Morototoni* also belongs. Here might be sought *S. paraensis* Ducke, Archiv. Jard. Bot. Janeiro 3: 228. 1922, with 9–10 leaflets.

San Martín: Near Rioja, 800 meters, *Weberbauer 4694*, type; 290.

Schefflera inambarica Harms, Bot. Jahrb. 42: 150. 1908.

Younger leaves and panicles densely reddish villous-puberulent, the pubescence more or less persisting unless on the nearly dull leaflets, these 7–11, to about 1.5 dm. long, 2.5–6 cm. wide, coriaceous, oblong- or oblong-obovate, obtuse at base, very shortly and abruptly acuminate, on petioles 1.5–2 dm. long or longer with conspicuous stipules, the petiolules 2.5–5 cm. long; panicles 3–4.5 dm. long, the numerous racemose heads (sessile or finally on peduncles 4–8 mm. long) subglobose, 8–10 mm. thick; petals 5, more or less cohering in a subglobose calyptra, densely villous within, puberulent without; stamens 5, ovary villous, becoming puberulent, 2–4 mm. long, the nearly plane disk with 3–5 very short finally divaricate styles.—May be a younger *S. Pardoana* but compared by the author to the more woolly pubescent *S. ferruginea* (HBK.) Harms which has long-acuminate leaflets. Type was 3 meters high. From the photograph and scrap of type it appears that Metcalf's specimen belongs here and shows leaflets to 2 dm. long, 8 cm. wide, the acumen 1 cm. long; the indument is greatly reduced, mostly to a puberulence; the fruiting heads are globose, nearly 2 cm. in diameter, the glabrate fruits almost 6 mm. long, 4 mm. across at top. F.M. Neg. 3479.

Puno: Between Sandía and Chunchusmayo, 2,000 meters, *Weberbauer 1080*, type; 242. Near Oconeque, *Metcalf 30604* (det. Killip).

Schefflera Klugii Harms, Notizbl. Bot. Gart. Berlin 11: 484. 1932.

Branchlets hirsute-tomentulose at tips; stipules 4–5 cm. high, the petioles about 3.5 dm. long, stout, nearly glabrous, the petiolules 3–7 cm. long; leaflets as many as 13, obovate-oblong, often cuneate or nearly obtuse at base, shortly acuminate (the acumen 1–1.5 cm. long), 15–22 cm. long, 6–10 cm. wide, chartaceous, glabrous; panicles very sparsely tomentulose or glabrate, 3.5 dm. long or longer; heads 8–11-flowered with broad villous bracts at base, many, racemose, on more or less tomentulose peduncles 2–5 mm. long; corolla calyptrate, conical, glabrous, 3 mm. long; stamens 5; disk thick, elevated medially; styles 5; ovary very short, somewhat whitish-pubescent.—Distinctive in the small heads (Harms). Apparently similar to *S. Dielsii* Harms, l.c. 12: 693. 1935, of Ecuador, leaflets 8 or 9, panicle branches 2–2.5 dm. long, style 5 or 6 in disk medially immersed, stellate-reflexed. The type number at Chicago was referred by Standley to *S. acuminata,* from which it is doubtfully distinct, but the leaflets as to type are more obovate and proportionately broader.

Loreto: Mouth of Río Zubineta, *Klug 2107,* type.

Sciodaphyllum Mathewsii Seem. Journ. Bot. 3: 268. 1865.

Branches and leaves glabrous; leaflets 8–10, oblong or obovate-oblong, obtusely or abruptly acuminate, obtuse or acutish at base, about 1 dm. long, 4 cm. wide, entire, coriaceous, lustrous and nearly evenose above, the veins rather prominent beneath; heads racemose-paniculate, the rachis and branches villous-puberulent, the peduncles angled; corolla hemispheric, puberulent, depressed at apex; stamens 5, the anthers oblong; styles 4–5; drupes obconic, 4–5-angled, glabrous (after Seemann).—Apparently is *Schefflera pedicellata* (R. & P.) Harms vel affine. The inflorescence is smoother in the Weberbauer collection.

Amazonas: Chachapoyas, (*Mathews,* type). Molinopampa, *Weberbauer 4345; 4346* (both det. Harms ex char.); 263.

Schefflera microcephala Harms, Bot. Jahrb. 42: 148. 1908.

As to type, epiphytic and about half a meter high; branchlets slender; petioles sparsely if at all puberulent, 5–14 cm. long, the stipules 1.5–2.5 cm. long, the petiolules evidently articulate, 1–2.5 cm. long; leaflets 5–8, oblong-lanceolate, shortly cuneate at base, narrowly and rather long-acuminate, 5–16 cm. long, 2–3 (4.5) cm. wide, chartaceous, glabrous or nearly, narrowly margined, the reticulate veins and 8–11 nerves prominent only beneath; panicles only about 2 dm. long, the peduncles of the many racemose heads 4–7 mm. long; heads 3–3.5 mm. thick, the floral bracts ovate, obtuse; calyx margin undulate to entire; petals connate in calyptra, nearly 2.5 mm. long, minutely appressed puberulent; stamens 8 or 9; disk little elevated, the very short stigma immersed; ovary broadly obconic, glabrous except for the sericeous base, 8–9-celled and styled.—Suggests *S. Ulei* in form of leaves and small heads but the styles (as to types) twice as many; these characters however, are doubtfully significant, and probably it is a variant of *S. Sprucei.*

Junín: Near Huacapistana in open woods, 2,100 meters, *Weberbauer 2108,* type.

Schefflera minutiflora Harms, Bot. Jahrb. 42: 153. 1908.

More or less deciduously white- or pale-villous-puberulent except the 7 ample chartaceous or subcoriaceous oblong leaflets above, these rounded at base, shortly or minutely acuminate, sparsely puberulent or glabrate beneath except for the 20 or more lateral nerves; petioles more than 5 dm. long; panicles much branched, the branchlets 1.5–3 dm. long, the numerous racemose umbels (their peduncles slender, 2–5 mm. long) 5–10-flowered, the minute flowers on pedicels scarcely 1–2 mm. long; calyx minutely 5-denticulate, petals calyptrate, nearly glabrous; ovary white villous, 5-celled, the disk nearly plane, the styles more or less coherent.—Except for the whitish pubescence very much like *S. Lehmannii* Harms, l.c. 20: Beibl. 69. 1895, of Colombia (Harms). Attains 3 meters. F.M. Neg. 3483.

San Martín: Near Moyobamba, 1,500 meters, *Weberbauer 4735,* type; 267.

Schefflera monzonensis Harms, Bot. Jahrb. 42: 154. 1908.

A meter high, the petioles (10–17 cm. long), leaflets beneath on nerves, and the panicles, at least when young, more or less covered with a sordid yellowish-white tomentum; stipules 4–5 cm. long; petiolules 7–22 mm. long; leaflets 5–7, narrowly oblong to lanceolate, obtuse or rounded at base, more or less gradually narrowed at apex into a rather long acumen, 8–14 cm. long, 2–4.5 cm. wide, chartaceous or coriaceous, glabrous above; panicles about 1.5 dm. long, the umbels 7–13-flowered on peduncles 5–10 mm. long; pedicels 3–5 mm. long, glabrous; disk elevated into style, this 4–5-parted apically, young fruits 4–5-angled.—Perhaps a variant of *S. pedicellata.*

Huánuco: Near Monzón, 2,400 meters, *Weberbauer 3418,* type; 255.

Schefflera moyobambae Harms, Bot. Jahrb. 42: 154. 1908.

Like *S. yuncacoyae* but the petioles 3 dm. long or longer and glabrous as the leaflets, these 9–11, shortly and abruptly cuspidate, 16–22 cm. long, 6–8 cm. wide; panicles 4–5 dm. long, some of the many umbels solitary in the axils or congested or verticillate, the peduncles 1.5–4 cm. long, 7–11-flowered; petals 5, cohering at tip, 2–2.3 mm. long; ovary glabrous, 5-celled; style simple, apically 5-branched.—Attains 8 meters. F.M. Negs. 3485; 3486 (leaves).

Cajamarca: Huancabamba, *Weberbauer 6118* (affine, Harms).—San Martín: Near Moyobamba, 1,300 meters, *Weberbauer 4741*, type; 267.—Puno: Sandía, 900 meters, *Weberbauer 1232* (affine, Harms).

Schefflera Pardoana Harms, Bot. Jahrb. 42: 149. 1908.

A shrub with glabrous branchlets; stipules 3–4 cm. long, the petioles 2 dm. long or longer and evanescently villous as the 5–9 petiolules, these 2.5–4.5 cm. long; leaflets oblong to lanceolate, rounded at base, often shortly acuminate, 8–17 cm. long, 3–5.5 cm. wide, coriaceous, above glabrous and somewhat lustrous, beneath deciduously rusty villous-puberulent or glabrate; panicles glabrate, about 3.5 dm. long, the racemose heads (their peduncles 5–10 mm. long) elliptic-ovoid, 2–2.5 cm. long; ovary 3–5-celled, more or less sericeous, 5–8 mm. long, the 3–5 styles connate at base, finally divergent.—Type 4 meters high; unique, according to the author, in the few ovary cells; the name commemorates the president of the country at the time described. F.M. Neg. 3487.

Junín: Near Huacapistana, 3,000 meters, *Weberbauer 2051*, type; 251.

Schefflera pedicellata (R. & P.) Harms, Pflanzenfam. 3, Abt. 8: 37. 1894. *Actinophyllum pedicellatum* R. & P. Fl. Peruv. 3: 73. *pl. 308*. 1802. *Sciodaphyllum pedicellatum* (R. & P.) Poir. Dict. 6: 746. 1804.

Open straggling or scandent shrub a meter or two high, the younger parts as the petiolules (3–4 cm. long), stipules (2–5 cm. long) and racemiform panicles 3–5 dm. long; upper petioles 5–8 cm. long, the soon glabrate or glabrous 9–13 leaflets nearly oblong, rounded-cordate at base, subabruptly and shortly acuminate, the apex itself acute, mostly 1–1.5 dm. long, 3–4 cm. wide, the lower nearly 3 dm. long, 7 cm. wide at the middle and narrowed to the cuneate base, the many nerves obvious above, more so and reticulate beneath; peduncles 1.5–2 cm. long, slender, the 7–13 pedicels about 5 mm. long; style branches 6 or 7 in type, or apparently also 4 or 5; fruits glabrous, sulcate-angled, subglobose, nearly 5 mm. in diameter.—F.M. Neg. 26160.

Huánuco: Muña and Cuchero, *Ruíz & Pavón*, type. Huacachi near Muña, *4120* (det. Johnston).

Schefflera pentandra (R. & P.) Harms, Pflanzenfam. 3, Abt. 8: 36. 1894. *Actinophyllum pentandrum* R. & P. Fl. Peruv. 3: 75. *pl.*

311. 1802. *Sciodaphyllum pentandrum* (R. & P.) Poir. Dict. 6: 747. 1804.

Growing tips, including especially the elongate racemiform panicles, early densely fulvous villous, at least the leaves glabrate at maturity or glabrous; petioles stout, probably longer than the ample leaves, these with 7–11 oblong-elliptic leaflets (petiolules of the upper about 3 cm. long) rounded at base, abruptly and acutely caudate-acuminate (acumen 2 cm. long or longer), mostly 2.5–3 or 4 dm. long, about 1 dm. wide, finely nerved and reticulate-veined both sides; heads densely villous in flower, subsessile, in fruit with stout peduncles 5–6 mm. long and nearly as thick; disk depressed, styles 4–5, short; fruits obconic, 8 mm. long, 4 mm. wide at top, glabrate.—Killip and Smith noted it as a 5-meter tree, leaves and inflorescence at summit. F.M. Neg. 29223.

San Martín: Moyobamba, *Weberbauer 4700* (det. Harms).—Huánuco: Cuchero and Chinchao, *Ruiz & Pavón*, type; *Dombey*. Pampayacu, *Sawada 4* (det. Standley). Cuchero and Casapi, (*Poeppig*). Monzón, *Weberbauer 3451* (det. Harms).—Junín: Huacapistana, *Weberbauer 2315* (det. Harms). Pichis Trail, *Killip & Smith 25682* (det. Harms).—Loreto: Cerro de Escalero, *Ule* (det. Harms).—Cuzco(?): Without number, *Gay*.

Schefflera peruviana Asplund, Svensk. Bot. Tidskft. 26: 193. 1932.

Tree; petiolules usually 3–6 cm. long, slightly puberulous, rather distinctly articulate tip and base; leaflets oblong-lanceolate, long-acuminate, shortly cuneate-rounded at base, 14–21 cm. long, 5–7 cm. wide, papyraceous, the nerves and veins both sides prominent and beneath sparsely pilose, the entire surface pilose above with divaricately 4-branched trichomes; inflorescence imperfectly known, rusty tomentose, scapiform, 3 cm. long, the flowers in sessile or subsessile heads of 15, 5 mm. thick, aggregate in a dense spike; bracts subentire, 1.6 by 1.4 mm., the entire or undulate calyx a little longer; petals connate, puberulent; disk entire; stamens 8–9 (7, 10), the stigmas short.—Differs from other species with more than 5 stigmas in the sessile heads. In the related *S. microcephala* Harms, *S. tipuanica* Harms of Bolivia and *S. angulata* (R. & P.) Harms the disk is lobed or crenulate. The trichomes suggest those of Malpighiaceae or Cruciferae but they are thinner-walled and the branches are shorter (Asplund).

San Martín: Near San Roque, Moyobamba, (*Melin 95*, type).

Schefflera sandiana Harms, Bot. Jahrb. 42: 153. 1908.

More or less deciduously stellate-villous puberulent shrub, as to type 4 meters high; petioles to nearly 4 dm. long, the petiolules 5–9 cm. long; leaflets 10 or 11, oblong-lanceolate, obtuse or rounded or rarely abruptly narrowed at base, minutely acuminate, to 32 cm. long, 11.5 cm. wide, chartaceous or subcoriaceous, glabrous or nearly above, glabrate or sparsely stellate beneath and with 17–20 prominent lateral nerves; panicles 4–4.5 dm. long with often more than a hundred racemose 10–15-flowered umbels on peduncles (8) 12–15 (20) mm. long; pedicels 2–3 mm. long; calyx 5-denticulate; petals calyptrate, membranous, coherent at tips; ovary more or less puberulent, 5-celled, the simple style 5-branched at apex.—Resembles, fide Harms, *Sciodaphyllum patulum* Rusby, Mem. Torr. Bot. Club 3, no. 3: 41. 1893, Bolivian, with glabrous inflorescence and leaflets, these with many fine parallel lateral nerves.

Puno: In woods below Tambo Cachicachi between Sandía and Chunchusmayo, 1,800 meters, *Weberbauer 1158*, type; 242.

Sciodaphyllum Sprucei Seem. Journ. Bot. 3: 268. 1865.

Leaflets 9, oblong-lanceolate, attenuate at base into the long (to 5 cm.) petiolule, acumen to about 2 dm. long, 6 cm. wide, glabrous, dark green above, paler beneath, the nerves purplish; rachis 2–3 dm. long and peduncles 6–7 mm. long, deciduously stellate tomentose; flowers sessile; heads (female) small; styles 4, recurved (Seemann).—Cf. *S. microcephala*. F.M. Neg. 26161.

San Martín: Tarapoto, *Spruce 4550*, type.

Schefflera Ulei Harms, Verhandl. Bot. Ver. Brandenb. 47: 186. 1905.

Stems glabrous, 1–4 meters high; petioles 12–17 cm. long, the petiolules 1.5–5 cm. long; leaves digitately 8-foliolate, the leaflets oblong-elliptic or oblanceolate, 11–22 cm. long, 6–7 cm. wide, rather abruptly narrowed to base, acuminate or cuspidate, entire, chartaceous; panicles congested, elongate, evanescently pubescent, the heads racemosely disposed on peduncles 6–12 mm. long, mostly 9–11-flowered, only 5–7 mm. thick, the peduncular bracts squamiform, the floral bracts semiorbicular or ovate; calyx entire; disk thick with 4–5 recurving styles, the ovary in type 5-celled, but *Williams 7019* has 7 styles.—Differs from *S. conica* and *S. acuminata* in the basally cuneate-narrowed leaves, the differences not very marked. F.M. Neg. 3490.

San Martín: San Roque, *Williams 7019* (affine, det. Harms). Pongo de Cainarachi, *Klug 2615* (det. Standley, *S. acuminata*).—Junín: Chanchamayo Valley, *Schunke 593* (probably affine, Harms).—Loreto: Cerro de Escaler, 1,300 meters, *Ule 6761*, type.

Schefflera Viguieriana Harms, Bot. Jahrb. 42: 150. 1908.

Similar to *S. inambarica* but the leaflets shortly narrowed or at least acutish at base, mostly abruptly and narrowly caudate acuminate, minutely and sparsely pubescent above and, especially, more or less deciduously but densely clothed beneath with a copper-red tomentum, 1–2.5 dm. long, mostly 6 cm. wide or wider; panicles congested, the subglobose heads lightly villous to glabrate, the bracts small; styles or stigmas 4 or 5.—Unlike *S. ferruginea* (HBK.) Harms in its less pubescent heads, much smaller bracts (Harms). Also, while the acumen is slender it is not almost filiform as in the more pubescent plant of Ecuador and Colombia. The name commemorates the notable anatomical research, particularly in this family, of R. Viguier. F.M. Neg. 3491.

Junín: Vicinity of Huacapistana, 2,500 meters, *Weberbauer 2113*, type.

Schefflera Weberbaueri Harms, Bot. Jahrb. 42: 151. 1908.

A 3-meter shrub with strong and thick branches; stipules broadly lanceolate, about 4 cm. long, the petioles at least five times as long, the petiolules 1–2 cm. long or longer; leaflets 11–13, oblong to lanceolate-oblong, emarginate at base, apparently only apiculate at tip, 13–20 cm. long, 4–6 cm. wide, coriaceous, evanescently puberulent and dull above, puberulent-tomentose beneath; panicles 3– nearly 4 cm. long, more or less puberulent, the many racemose heads (peduncles 2–4 mm. long) globose, 7–9 mm. thick; calyx margin subentire or minutely denticulate, the calyptriform angled corolla puberulent, 2 mm. long; stamens 15–21; disk fleshy, deeply depressed medially; ovary sericeous; styles 5–7, free, subulate.—F.M. Neg. 3492.

Huánuco: Near Monzón, 2,400 meters, *Weberbauer 3413*, type; 255.

Schefflera yuncacoyae Harms, Bot. Jahrb. 42: 155. 1908.

A shrub 3 meters high, the stipules 3–6 cm. long, the petioles glabrate, 8–16 cm. long, the petiolules early yellowish-white villous, later glabrate, 0.5–3 cm. long; leaflets 5–7, oblong-lanceolate, obtuse or acutish at base, rather long or shortly acuminate, coriaceous, the younger with scattered trichomes above, these dense on the midnerve beneath and on the petiolules, the adult glabrous or nearly, 10–19 cm. wide, with many little prominent lateral nerves; panicles 2.5–3 dm. long, glabrous or nearly, the umbels racemose or subverticillate; fruiting peduncles 1–3 cm. long, the very sparsely puberulent to glabrous pedicels 5–8 mm. long; young fruits 4–5-angled, glabrous, the style divided into 4–5 recurving branches.—Cf. *S. moyobambae.* F.M. Neg. 3493.

Puno: In thickets between Sandía and Chunchusmayo, 1,800 meters, *Weberbauer 1153*, type; 242.

5. **DENDROPANAX** Dcne. & Planch.

Gilibertia R. & P. Prodr. 50. *pl. 8.* 1794, not Gmelin, 1791.

Like *Schefflera* but in Peru leaves simple, ligule not obviously developed and petals distinct.—The name was adopted by A. C. Smith, Trop. Woods 66: 1–3. 1941 and North Amer. Flora 28B, pt. 1: 14. 1944. Viewed objectively the group is clearly a part of *Schefflera* but within Peru it constitutes a recognizable segregate. The Peruvian species are probably fewer than have been proposed.

Inflorescence a congested (and capitate) terminal raceme. *D. Weberbaueri.*
Inflorescence a panicle or more or less openly umbelliform.
  Leaves remotely but sharply denticulate with prominent marginal nerve .... *D. marginiferus.*
  Leaves entire or undulate with obsolete or obscure marginal nerve.
    Peduncles about 1 mm. thick, divaricate, remote; pedicels 1–3 mm. long in flower .... *D. Tessmannii.*
    Peduncles about 2 mm. thick, more or less ascending, approximate; pedicels 3–8 mm. long in flower.
      Leaves about twice longer than wide.
        Peduncles more or less clearly articulate; leaves usually short-acuminate or acute .... *D. umbellatus.*
        Peduncles continuous; leaves abruptly, often rather narrowly, cuspidate or caudate ... *D. macropodus, D. arboreus.*
      Leaves about three times longer than wide.
        Leaves broadly and obtusely short-acuminate. *D. Williamsii.*
        Leaves rather narrowly, subacutely short-acuminate. *D. cuneatus, D. arboreus.*

Dendropanax arboreus (L.) Dcne. & Planch. Rev. Hort. sér. 4. 3: 107. 1854; Britton, Bull. Dept. Agric. Trin. 19: 230. 1922. *Aralia arborea* L. Syst. Nat. ed. 10: 967. 1759. *Gilibertia arborea* (L.) March. in Durand & Pittier, Bull. Soc. Bot. Belg. 30: 281. 1891.

Shrub or slender tree to 12 meters high; petioles of younger leaves to 4 dm. long, the blades often 3–5-lobed; petioles usually (mature leaves) 6 cm. long more or less, the blades ovate to elliptic, oblong or obovate-oblong, ordinarily about 1.5 dm. long, one half to a third as wide, obtuse to acute or cuneate at base, commonly obtusely acuminate or cuspidate at apex, entire or undulate or remotely crenate, 4–8-nerved, the reticulate veins often obvious both sides; umbels 5–20 in a terminal raceme, the continuous or rarely articulate(?) peduncles divaricate, 1–7 cm. long; bracts, if present, rarely connate; pedicels usually 3–8 mm. long or longer in fruit; flowers 5–7-merous, the styles free only at tip; fruits 4–8 mm. thick, sometimes narrower with 5–7 seeds.—After A. C. Smith, who pointed out (Brittonia 2: 249–250. 1936) the variability of the species; and it may be found to include one or two of the Peruvian shrubs as variants. A specimen from Chicoplaya referred here by Harms must have been a casual determination as from the scrap seen it seems to be *D. Tessmannii* or possibly a young state of *D. umbellatus.*

Loreto: Mishuyacu, *Klug 2559* (det. Standley, *D. macropodus*). Mexico; West Indies; South America.

Dendropanax cuneatus (DC.) Dcne. & Planch. Rev. Hort. sér. 4. 3: 107. 1854; 1878. *Gilibertia cuneata* (DC.) March. l.c. *Hedera cuneata* DC. Prodr. 4: 262. 1830.

Tree, the ultimate branches 3–6 mm. thick, the leaves approximate toward tip on petioles 4–6 cm. long or the lower to 1.5 dm. long; leaves long obovate-oblong (or in var. *abbreviata* March. elliptic-obovate, mostly shortly cuneate, in var. *ramiflora* (DC.) March. oblong, acute both ends, mostly subcuneate), typically long-cuneate at base, acute, 12–20 cm. long, 3–6 cm. wide, entire (not at all undulate in drying), papyraceous or submembranous, secund nerves 5–8, reticulate veins prominent especially below; racemes 5–7 cm. long, much shorter than upper leaves; peduncles 2–4 cm. long, basal bracts ovate, concave; umbels 15–50-flowered, pedicels 3–6 (15) mm. long, scarious bracted; drupe 5–6 mm. in diameter, 5-sulcate, styles long-connate, radiately diverging.—Racemes often 1 dm. long or longer. Widely distributed, probably within Peru.

San Martín: Tarapoto, *Ule 6468* (det. Harms).—Río Acre: Seringal San Francisco, *Ule 968* (det. Harms). Brazil.

Dendropanax macropodus Harms, Notizbl. Bot. Gart. Berlin 15: 693. 1942. *Gilibertia macropoda* Harms, l.c. 9: 980. 1926.

Glabrous tree, the branchlets stout; petioles 2–11 cm. long; leaves more or less oblong-obovate and narrowed at base, shortly acuminate, 13–20 cm. long, 6–12 cm. wide, coriaceous, the lateral nerves only 4–5 each side of the midnerve, this prominent beneath; terminal panicle sessile or shortly peduncled, umbellulately divided, the peduncles continuous, often greatly elongated, 2.5–10 cm. long, 2–3 mm. wide, the bracts at the base of the peduncles scale-like; umbels densely many-flowered; pedicels 5–8 mm. long; calyx teeth minute or obsolete; petals 5–8, broadly lanceolate, acute, 2 mm. long; stamens 6–8; ovary ovoid to subglobose, the stigmas 6–8.—Smaller umbels and longer pedicels than *G. resinosa* (Benth.) March., a Brazilian species with obscure lateral nerves (Harms). The nearly sessile terminal inflorescence may be characteristic but the species does not seem to be well defined. To 15 meters high. F.M. Neg. 3545.

Loreto: Mouth of the Santiago, *Tessmann 4712*, type. Río Mazán, *José Schunke 342*. Cachipuerto, Río Cachiyacu, *Klug 3124* (det. Standley). Mishuyacu, *Klug 890* (det. Harms, aff. *D. Tessmannii*). Florida, *Klug 2023* (det. Standley). Bolivia; Brazil.

Dendropanax marginiferus Harms, Notizbl. Bot. Gart. Berlin 15: 693. 1942. *Gilibertia marginifera* Harms, l.c. 11: 490. 1932.

Branchlets pale; petioles 2–7 cm. long; leaves ovate to obovate or broadly oblong, cuneately narrowed at base, shortly or minutely acuminate, 10–17 cm. long, 5–11.5 cm. wide, chartaceous, glabrous, more or less distinctly nerve-margined and remotely but sharply denticulate; inflorescence peduncle very short, the peduncles of the umbels 1–1.5 cm. long, annulately bracted below the middle; pedicels 1–3 mm. long, the flowers minute, the style simple.—Separated by the author from *G. umbellata* with much larger umbels and without definite marginal leaf-nerve.

San Martín: Alto Río Huallaga, 900 meters, *Williams 6595a*, type.

Dendropanax Tessmannii Harms, Notizbl. Bot. Gart. Berlin 15: 693. 1942. *Gilibertia Tessmannii* Harms, l.c. 9: 144. 1924.

Completely glabrous tree; petioles short or sometimes 1.5–15 cm. long; leaves simple, oblong to obovate-oblong, more or less narrowed to base, somewhat acuminate, abruptly and acutely short-caudate, 9–21 cm. long, 4.5–11 cm. wide, entire, papyraceous or subchartaceous; panicle terminal, short, the sessile or subsessile rachis 1–2 cm. long, the flowers 6–12 in little heads umbellately disposed; bracts scale-like, 2–2.5 mm. long; peduncles 5–20 mm. long; floral bracts shorter than the subsessile flowers, these, including the typically obscure pedicel, 4–5 mm. long; calyx broadly 5-denticulate; petals deltoid-ovate, nearly 2 mm. long; ovary glabrous, obconic, little angled, the style column simple, the 5 stigmas scarcely distinct in anthesis.—Outstanding in its nearly sessile flowers, the fruit sometimes narrowed into a pedicel at base; *Klug 4096* and *2016* have pedicels 2–3 mm. long. F.M. Neg. 3549.

Leaves chewed to strengthen teeth, making them black (Klug).

San Martín: Chazuta, *Klug 4093; 4096; 4147* (det. Standley, *G. macropoda*).—Huánuco: Chicoplaya, *Ruiz & Pavón* (could be *D. umbellatus*, only scrap seen).—Loreto: Montealegre on the Pachitea, *Tessmann 3003*, type. Florida, Río Putumayo, *Klug 2008; 2016; 2201* (det. Standley). Balsapuerto, *Klug 2945* (det. Standley). Bolivia. "Ogu-isi," "chirez" (both, Klug).

Dendropanax umbellatus (R. & P.) Dcne. & Planch. Rev. Hort. sér. 4. 3: 107. 1854. *Gilibertia umbellata* R. & P. Fl. Peruv. 3: 75. *pl. 312.* 1802. *Gilibertia Pavoni* (Dcne. & Planch.) March. in Mart. Fl. Bras. 11, pt. 1: 248. 1878. *Dendropanax Pavoni* Dcne. & Planch. l.c. fide Marchal.

Shrub or tree-like, the ultimate strongly ridged fleshy branches 2–5 mm. thick, the leaves crowded at their tips; petioles 5–10 cm. long, very shortly dilated at base; leaves ovate or elliptic, obtusish or acute at base, often shortly and abruptly acute or acuminate, 1–2 dm. long, (5) 8–9 cm. wide, entire, or in type obsoletely denticulate, the teeth remote, minute cusps, the secondary nerves 5–8 on each side, the lower 2 longer; umbels 25–50-flowered (only 15 in type), racemes 4–6 cm. long on peduncles 2–5 cm. long, the lower branches often reflexed, deeply sulcate and basally or below the middle bracteate and more or less clearly articulate, the bracts rather squamate; pedicels 5–7 mm. long; calyx 7–9-dentate in type, or 5-dentate; petals elliptic, acute, greenish-white, 2 mm. longer than calyx; styles short, the column shorter than the disk; drupe about 5 mm. across, globose-ovoid, little narrowed above, shallowly 5-sulcate.—Probably is a part of *D. arboreus*. *G. resinosa* (Benth.) March. of northern

Brazil has the inflorescence branches continuous. F.M. Negs. 3547; 29224.

Huánuco: Panao and Chinchao, *Ruiz & Pavón* (type, *G. Pavoni*). Cuchero, *Poeppig 1525*. Muña, *Ruiz & Pavón*, type. Río Pozuzo, *Weberbauer 6748*. Brazil.

Dendropanax Weberbaueri Harms, Notizbl. Bot. Gart. Berlin 15: 692. 1942. *Gilibertia Weberbaueri* Harms, Bot. Jahrb. 42: 160. 1908.

Entirely glabrous shrub, the branchlets with a yellowish-white bark, the leaves papyraceous or subchartaceous and thinly margined (the margin entire or very minutely and remotely denticulate), and, uniquely among Peruvian species, the inflorescence a congested terminal raceme 3–18 mm. long on a peduncle 3–4 cm. long; petioles 2.5–10 cm. long; leaves oblong, obtuse or acute at base, rather abruptly short-acuminate, 6–14 cm. long, 2.5–7 cm. wide, with 7–9 arcuate-ascending lateral nerves, the veins inconspicuous beneath; lower portion of rachis with many empty scale-like bracts; pedicels 5–11 mm. long; calyx minutely 5-dentate; petals lanceolate-deltoid, inflexed apically, 2 mm. long; disk plane; ovary short, lightly 5-angled, 5-celled, the style column very short and broad, the stigmas 5. —Type 2 meters high. F.M. Neg. 3550.

Huánuco: Between Monzón and the Río Huallaga, 600 meters, *Weberbauer 3669*, type; 285.

Dendropanax Williamsii Harms, Notizbl. Bot. Gart. Berlin 15: 693. 1942. *Gilibertia Williamsii* Harms, l.c. 11: 490. 1932.

Allied to *D. umbellatus;* petioles 1–3.5 cm. long; leaves broadly lanceolate to narrowly oblong, acute at base, obtusely a little acuminate at apex, 7–13 cm. long, 2–4.5 cm. wide, rather firm-chartaceous, lustrous, entire or slightly undulate; inflorescence rachis nearly 1 cm. long, the umbels many on peduncles 1.5–2.5 cm. long, these with very broad basal bracts; pedicels 3–6 mm. long; ovary glabrous, to 4 mm. long; calyx undulate; corolla glabrous, in bud semiglobose, 1–1.5 mm. long.—With almost exactly the inflorescence of *D. umbellatus* and with similar thick flowers but leaves not at all dentate (Harms). Williams (Field Mus. Bot. 15: 401. 1936) described the wood from the type, a tree 15 meters or taller, with a spreading crown, straight round trunk 3 dm. in diameter, unbranched for 7 to 8 meters, the light tan-colored outer bark with a spicy odor.

San Martín: San Roque, 1,500 meters, *Williams 7398*, type. Zepelacio, *Klug 3688* (det. Standley). "Achcu-isman."

CORNACEAE Endl.

Reference: Wangerin, Pflanzenreich IV. 229. 1910.

Shrubs or small trees (Peruvian species), the leaves usually opposite, estipulate, the flowers hermaphrodite, small, in dichotomous cymes. Calyx tube adnate to the ovary. Petals 4, valvate, the stamens the same number and alternate with them. Disk pulvinate, in the male flower central. Ovary 2- (rarely 3-) celled, the simple style with truncate or capitate stigma, the ovule solitary and pendulous in each cell. Fruit an ovoid or oblong drupe, areolate apically, with two oblong compressed seeds, the endosperm abundant.

CORNUS L.

Characters of the family as given here, this being the only genus known in the Andes. However, also in South America is *Griselinia* Forst. of New Zealand, Brazil and Chile, with alternate thick often spinose leaves and minute 5-merous flowers, the petals imbricate, or lacking in the female. I suspect that some Peruvian material has been confused, even described as species of *Viburnum* which is similar in many respects but that group has gamopetalous flowers, fruit a fleshy berry.

Cornus peruviana Macbr. Trop. Woods 19: 5. 1929. *C. boliviana* Macbr. l.c. fide Standley, l.c. 43: 16–17. 1935.

Branchlets glabrous; petioles about 1 cm. long; leaves ovate-oblong or -elliptic, acute at base, more or less abruptly acuminate or subcaudate, mostly about 1 dm. long, 3–6 cm. wide, or the larger to 13 cm. long, 5.5 cm. wide, green, somewhat lustrous and minutely if at all pubescent above, paler and more or less appressed strigillose beneath, often also pilose-barbate in the axils of the rather prominent lateral nerves; cymes few-flowered, ebracteate; petals free, about 4 mm. long; fruits subovoid or ellipsoid, nearly 1 cm. long, lightly costulate and minutely strigillose.—Standley, l.c., remarked the ambiguity of my own doubt regarding the position of this species as I had myself insisted that the pubescence and fruits were entirely those of *Cornus!* In Peru collected as a shrub or tree 4 to 5 meters tall but in Ecuador said to be found large, the wood used locally in construction.

Huánuco: Cani east of Mito, *3439*, type.—Apurímac: In low forest, Ampay, *Goodspeed Exped. 10602* (det. Standley); *Vargas 763.* Bolivia to Ecuador. "Palo de Rosa" (Solis, Ecuador).

CLETHRACEAE Klotzsch

Shrubs or small trees with stellate pubescence or rarely nearly glabrous, the often fragrant white flowers in subterminal racemes or panicles, often spike-like, rarely subcorymbose or fasciculate. Calyx deeply 5-parted, the lobes persisting, imbricate as the 5 free petals. Stamens 10–12, free; anthers extrorsely inflexed in bud, sagittate, opening by apical pores. Pollen simple. Disk obsolete. Ovary superior, 3-lobed, 3-celled, the style more or less 3-lobed. Fruit a 3-lobed loculicidal capsule with 2-cleft valves.—Closely allied to Ericaceae with which it has been associated logically, but distinct as Monotropaceae, similarly with simple pollen.

CLETHRA [Gronov.] L.

Cuellaria R. & P. Syst. 103. 1798; Prodr. 59. *pl. 10.* 1794.

Character of the family, the only genus. Evergreen or deciduous, sometimes cultivated as "Pepperbush," "Lily of the Valley shrub" or more appropriately as "White Alder," Clethra being the ancient Greek name for Alder, which the leaves suggest.

The great need of a revision will be apparent to anyone trying to bring the many names proposed for species and the accumulated specimens together; apparently, unless characters have been overlooked, the species are actually even fewer, at least in Peru, than the following key, of necessity casual, suggests, and my interpretations and synonyms are perhaps, at least sometimes, expedient.

Leaves glabrous or nearly, at least at maturity.
  Petioles about 5 mm. long........................*C. cutervoana.*
  Petioles about 1 cm. long or longer................*C. peruviana.*
Leaves distinctly pubescent or rarely glabrate in age beneath.
  Pedicels, at least mostly, distinctly longer than flowers at full anthesis.
    Petals exceeding sepals; leaves closely stellate beneath. *C. Sprucei.*
    Petals about equaling sepals; leaves laxly stellate beneath. *C. macrostachya.*

Pedicels, unless sometimes those of central axis, shorter than or equaling the flowers.

Leaf indument beneath predominantly villous; petioles short. *C. castanaefolia, C. nervosa.*

Leaf indument beneath not predominantly villous.

Indument, unless in age, reddish tomentose; petioles mostly or all shorter than 1 cm. . . . . *C. ferruginea.*

Indument finely gray-stellulate; petioles mostly about 1 cm. long or longer.

Petals longer than sepals; leaves rigid . . . . *C. revoluta.*

Petals and sepals subequal; leaves flexible . . . . . . *C. obovata.*

Clethra castanaefolia Meissn. in Mart. Fl. Bras. 7: 169. 1863.

Branches, younger leaves and peduncles softly villous-hirsutulous with rusty or reddish trichomes; petioles stout, 6 mm. long; leaves oblong, attenuate at base, mucronately serrate toward the acute tip, 5–8 cm. long, 18–28 mm. wide, rigid, becoming glabrous and lustrous above, rusty villous beneath, the nerves impressed, the veins obsolete above, the former acute, the latter reticulate beneath; racemes fasciculate, the slender pedicels equaling the subpuberulent calyces, those of the central raceme 2–3 mm. long.—At least in Peru seems to be *C. nervosa* Duham.

Peru (possibly). Brazil.

Clethra cutervoana Szyszyl. Dissert. Classis Math.-Phys. Acad. Litt. Cracov. 29: 228. 1895; Rospr. Akad. Umiej. Krackow. ser. 2. 9: 222. 1895.

Tree, branches terete, younger whitish, glabrous; petioles sulcate, 1–3 mm. thick, 3–7 mm. long; leaves ovate-lanceolate, subobtuse at base, 4–6 cm. long, half as wide, coriaceous, glandular-serrate, glabrous, the lateral nerves prominent beneath; inflorescence terminal, the branches crowded, fulvous-hirsute, 9–14 cm. long, about as broad, racemes 6–9 cm. long (peduncles 1–2 cm. long), simple, many-flowered, the solitary recurving pedicels 2–3 mm. long, the linear lanceolate bracts long-persistent, 3–4 mm. long; calyx 1.5–2 mm. long, the lanceolate or lanceolate-ovate lobes about half as long as the corolla, this with ovate, emarginate erose-denticulate lobes, fulvous-tomentose without; ovary depressed globose, tomentose, 2- or 3-celled, the short, subclavate style with short 3-lobed stigma; capsules tomentose, 5–6 mm. in diameter.—*C. ovalifolia* Turcz., Bull. Soc. Bot.

Mosc. 36, pt. 2: 232. 1863, of Ecuador may be the earlier name, but its leaves as to type are somewhat smaller. F.M. Negs. 31966; 22757 (*C. ovalifolia*).

Cajamarca: Cutervos, *Jelski 160, 256,* type.—Amazonas: Chachapoyas, *Mathews.*

Clethra ferruginea R. & P. Fl. Peruv. 4: *pl. 380.* 1802. *Cuellaria ferruginia* R. & P. Syst. Veg. 103. 1798. *C. divaricata* Duham. Arb. ed. nov. 5: 134. 1801–1819. *C. Mathewsii* Turcz. Bull. Soc. Bot. Mosc. 36, pt. 2: 232. 1863. *C. cuneata* Rusby, Bull. N. Y. Bot. Gard. 4: 314. 1907.

Densely branched small tree or shrub, the rigid coriaceous leaves beneath, branchlet tips and racemes conspicuously lanate- or at least tomentose-villous; petioles usually about 5 mm. long; leaves oblong-oval or elliptic-obovate, more or less narrowed to base or subrounded, rounded and obtuse or apiculate at apex, early about 4 cm. long; racemes typically crowded, 4–8 cm. long, sometimes longer, densely flowered, the pedicels clearly shorter than the tomentose calyces, these about 3.5 mm. long, the petals somewhat exserted.—F.M. Negs. 16816; 38279 (Dombey); 26281 (Mathews).

San Martín: Tarapoto, *Williams 5992.*—Amazonas: Moyobamba, *Weberbauer 4475* (det. Fedschenko). Chachapoyas, *Mathews 1476* (type, *C. Mathewsii*).—Huánuco: Cani, near Mito, *3458* (det. Markgraf, *C. Mathewsii*). Near Mito, *1942.* Pillao, *Ruíz & Pavón,* type; *Woytkowski 34060* (det. Cuatrecasas). Pampayacu, *Kanehira 243.* Bolivia.

Clethra macrostachya Duham. Arb. ed. nov. 5: 155. 1801–1819. *C. pedicellaris* Turcz. Bull. Soc. Bot. Mosc. 36, pt. 2: 234. 1863. *C. obovata* R. & P. var. *Sprucei* Meissn. in Mart. Fl. Bras. 7: 169. 1863. *C. guianensis* (Kl.) Meissn. l.c. 170, at least as to Peru.

Young branchlets, petioles, these sometimes 2–2.5 cm. long, peduncles and leaves beneath, especially on the prominent nerves, densely reddish-villous or pilose-stellate; leaves basally oblong-obovate, little narrowed to base, often obtuse or retuse and mucronate, obscurely and remotely callous-denticulate, the uppermost usually 1–1.5 dm. long, 4.5–6 cm. wide, impressed reticulate above, more or less evanescently and minutely pubescent; racemes several, terminal, often 1.5–2 dm. long; pedicels about 4 mm. long or about twice as long as the densely pubescent calyx, the petals somewhat exserted.—F.M. Negs. 29276; 38592; 16818 (Haenke); 22758 (Spruce).

San Martín: Zepelacio, *Klug 3661* (det. Standley, *C. brasiliensis*). Tarapoto, *Spruce 4833* (type, *C. pedicellaris*).—Huánuco: Monzón, *Weberbauer 3567* (det. Schellenberg). Cuchero, *Dombey*, type.—Junín: Huacapistana, *Killip & Smith 24506*.

Clethra nervosa Duham. Arb. ed. nov. 5: 133. 1801–1819. *C. guianensis* (Kl.) Meissn. var. *brevis* Macbr. Candollea 6: 16. 1934?

Branchlets with numerous reddish trichomes; petioles very short, densely tomentose; leaves ovate-oblong, about 3 cm. wide, 5–8.5 cm. long, minutely denticulate, the many nerves prominent beneath and densely villous-tomentose, at maturity nearly glabrous above; spikes pubescent, 6–8, terminal, 5–7.5 cm. long.—In type the tomentum is early compact and pale beneath between the nerves, villous but more or less subappressed in age, coriaceous and brittle. My variety of *C. guianensis* not seen in preparation of this account; it may be a part of *C. obovata*. F.M. Negs. 29277; 38593; 26278 (as *C. guianensis*); 16813 and 16814 (as *C. brasiliensis*, var.).

San Martín: Zepelacio, *Klug 3280* (distr. as *C. Mathewsii*). San Roque, *Williams 7642*. Near Moyobamba, *Woytkowski 35291* (distr. as *C. brasiliensis*); *Weberbauer 4475* (distr. as *C. brasiliensis*, var.).—Huánuco: Cuchero, *Dombey*, type. Monzón, *Weberbauer 3511* (distr. as *C. brasiliensis*, var.).—Junín: Chanchamayo Valley, *Schunke 194* (type, *C. guianensis*, var. *brevis*). San Ramón, *Killip & Smith 24771?*

Clethra obovata R. & P. Fl. Peruv. 4: *pl. 381*. 1802. *Cuellaria obovata* R. & P. Syst. 104. 1798. *C. brasiliensis* Cham. in Linnaea 8: 510. 1833, at least as to Peru. *C. micrantha* Remy, Ann. Sci. Nat. sér. 3. 8: 233. 1847.

Shrub or small tree, the indument arenose-pubescent, soon lacking on the leaves above, petioles (1–2.5 cm. long) and branchlets; leaves oblong-elliptic-obovate, broadly cuneate to base, rounded and barely acute or apiculate at apex, often 7–15 cm. long, about 4–6 cm. wide, chartaceous-coriaceous, subentire or minutely denticulate, the slender nerves impressed above, prominent beneath, the reticulation fine; racemes slender, often arcuate, 8–15 cm. long, usually in part with 1 or more panicles; pedicels 2–2.5 mm. long or not longer than the small flower; petals little or not exserted.—Perhaps not distinct from *C. revoluta*. F.M. Negs. 16819; 29278.

Cajamarca: Cutervo, *Jelski 255*.—Huánuco: Chicoplayo, *Ruiz & Pavón*, type.—Junín: Huacapistana, *Killip & Smith 24520* (distr. as

C. brasiliensis); *Weberbauer 1984.*—Ayacucho: Ccarrapa, *Killip & Smith 22445* (distr. as *C. brasiliensis*).—Cuzco: Marcapata Valley, *Weberbauer 7848* (det. Mansfeld); *Vargas 3160.* Cosnipata, *Weberbauer 6927.* Pillahuata, *Pennell 13916.* Paucartambo, *Vargas 311.* —Puno: Sandía, *Weberbauer 1124.*

Clethra peruviana Szyszyl. Dissert. Classis Math.-Phys. Acad. Litt. Cracov. 29: 227. 1895; Rospr. Akad. Umiej. Krackow. ser. 2. 9: 227. 1895.

Tree, the gray terete branches longitudinally striate, the younger and the inflorescence ferrugineous-tomentose, otherwise glabrous; petioles stout, sulcate, 1–1.5 cm. long; leaves lanceolate, subrotund or attenuate into petioles, 9–12 cm. long, 3–4 cm. wide, coriaceous, remotely denticulate serrate to entire, the lateral nerves impressed above, distinctly elevated beneath; inflorescence terminal, racemose, composite, to 1.5 dm. long, 1.7 cm. wide, the long-peduncled racemes 7–12 cm. long, simple, many-flowered with some hispid indument intermixed with the tomentosity; pedicels solitary or binate, 4–5 mm. long; calyx 2–2.5 mm. long, the lobes ovate lanceolate, puberulent tomentose without; corolla lobes oboval, emarginate, cucullate, erose-denticulate, twice as long as the calyx; stamens included, glabrous; ovary globose, tomentose, the clavate style 1.5–2 mm. long, the stigma distinctly 3-lobed.—Apparently if distinct this is to be compared with *C. bicolor* and *C. fagifolia* HBK. of Colombia and *C. laevigata* Meissn. of Brazil. F.M. Neg. 4575.

Cajamarca: Tambillo, *Jelski 257; 275,* type. Near Socota, *Stork & Horton 10129* (det. Standley).

Clethra revoluta R. & P. Fl. Peruv. 4: *pl. 380.* 1802. *Cuellaria revoluta* R. & P. Syst. 103. 1798.

Indument, except on the rachis of the clustered terminal racemes, these 7–10 cm. long and slightly spreading-villous, a compact gray-brown stellulate tomentum; petioles stout, glabrate, about 1 cm. long; leaves oblong-elliptic, rounded at base, obtuse or subacute, mostly about 8 or 9 cm. long, at least half as wide, soon glabrous above, the nerves impressed, early densely short stellulate-tomentose beneath, especially between the prominent nerves and reticulate veins, drying hard-coriaceous, the nearly entire margins somewhat tuberculate in age; pedicels 2–2.5 mm. long subequaling the puberulent calyces, these clearly stouter than the more or less crenulate petals. Dense shrub or tree, 3–7 meters tall with fragrant white flowers. F.M. Neg. 16820.

Cajamarca: Near Socota, *Stork & Horton 10128* (det. Standley, *C. brasiliensis*).—San Martín: Río Shilcayo, *Belshaw 3279*.—Huánuco: Cuchero, Chinchao and Pillao, *Ruiz & Pavón*, type. Panao, *3613* (det. Markgraf). Pampayacu, *Sawada 56*. Huamalies, *Weberbauer 3571* (det. Fedschenko).—Junín: Río Portachuelo, 2,800 meters, *Weberbauer 6676* (det. Mansfeld & Markgraf). Ecuador.

Clethra Sprucei Turcz. Bull. Soc. Bot. Mosc. 36, pt. 2: 232. 1863.

Branchlet tips, peduncles and uppermost petioles villous with spreading trichomes; petioles as flowering branches soon glabrate, the former to about 1 cm. long; leaves oblong-obovate, basally cuneate to the rounded base, rounded to the shortly acute tip, 4–6 cm. long, 2–2.5 cm. wide, slightly revolute, remotely and minutely callous-denticulate, glabrous above, beneath between the reticulate veins compactly short-stellate, this indument early white or pale; racemes 1–1.5 dm. long, the longest pedicels 3 mm. long; petals and calyx subequal, about 4 mm. long; style apically 3-denticulate, stigmas globose.—Perhaps *C. castanaefolia* Meissn. in Mart. Fl. Bras. 7: 169. July 10, 1863, but this ex char. with different indument; probably not separable from *C. macrostachya*. F.M. Neg. 22759.

San Martín: Tarapoto, *Spruce 4802*, type.

ERICACEAE Lindl. (or DC?). Heather Family

Thibaudiaceae A. C. Smith, Contr. U. S. Nat. Herb. 28, pt. 2: 311–547. 1932. *Vacciniaceae* Sleumer, Bot. Jahrb. 71: 376–427. 1941.

Shrubs, sometimes trees, less frequently herbs, scandent or epiphytic, often evergreen. Leaves alternate except in a few genera, stipules rarely obvious or present. Flowers borne variously, regular or nearly so; stamens ordinarily as many or twice as many as the usually 4–5-lobed or -petaled corolla, free from it, the anthers 2-celled and often extended into tubules that are terminally or longitudinally dehiscent and appendaged in greater or less degree to not at all. Pollen compound (4 united grains). Ovary superior or inferior, 4–10 (rarely 1, 2 or 3) -celled with usually exile placentae, the ovules many. Style 1, the stigma entire or lobed. Fruit a capsule, berry or drupe.

The Blueberry and Cranberry (Vacciniaceae), popular for their distinctive flavors in both the Old World and the New, and decorative Heathers have unimportant counterparts in Peru, but the family is abundantly represented by shrubs with showy flowers.

The species groups at present designated as genera in the tribe Vacciniaceae (Thibaudiaceae) have so many interlocking characteristics that the names usually rest on a single one as unique or basic, the associated characters varying or in combinations relatively developed. Thus, actually, the accident of tradition, evolved from the species first described, is often the principal factor defining at least the older generic names. Many of the newer (including those of Klotzsch) are names proposed logically in accord with the earlier diagnosis as expanded or modified with the discovery of new specific entities. This is a perfectly natural occurrence, more noticeable here than in many other families. Because of the closely intertwined characters the interpretation of generic boundaries will rest from time to time upon the botanical philosophy or viewpoint of the prevailing authority, this affected no doubt by the mode popular in this type of endeavor during his lifetime. Some modification of this by necessity more or less arbitrary situation, may occur with greater knowledge than the materials now known provide. Smith (Journ. Arnold Arb. 27: 103. 1946) wrote in similar vein ". . . the genera must be based upon combinations of characters, the value of various combinations resting upon personal opinion for the time being—but perhaps essentially upon genetic analysis." However, since even within so restricted an area as Peru many genera as defined merge, or rest on a single character, the classification may be clarified either by defining some groups more narrowly or by including more associated characters to accommodate the stronger or so-called aberrant species, many still undiscovered, within the orbit of a few prevailing trends in specification. These were presented admirably by Smith in his original work and in later observations as to probable phylogenetic origins. How these apparently sound lines of evolution are to be represented in a lineal setup (for convenience) depends, it may be remarked again in another way, on one's purpose or interest, floristic or monographic, and presumably philosophical. Apropos is Smith's explanation (Journ. Arnold Arb. 27: 103. 1946): "The alternative to recognizing small genera (although several have 25–100 species) seems to be to recognize very few, or perhaps only one. Should the latter course be followed, the resulting maze of subgenera, sections or subsections would be quite unintelligible to the average student; such a treatment would hardly seem likely to clarify the sequence of species-development." Any botanist of some experience would surely agree with this. That is the reason that it would be more natural and less confusing, it seems to me, to draw fewer generic lines so that a majority of the series of species that show a number of similar or relatively developed characteristics would be found under generic names together, as they naturally belong; of course in a family such as this there will always be intermediate species, connecting ones; now, with many names all purporting to rank alike, the classification obscures nature's homogeneity here, often in trite or trivial manner, or, as Smith puts it, "current generic lines are indeed rather tenuous" (Contr. U. S. Nat. Herb. 29: 351. 1950).

Confronted with this problem, I have made an attempt to key the known Peruvian species without consideration of present generic lines, as a possible aid to determinative work. In this key the characters used are often expedient and may be only suggestive, otherwise this account is compiled largely from the work of Smith, which is a model for detailed information and analysis presented with clarity and obvious integrity, presaging the young author's present eminence. More recently, Sleumer, l.c., keyed the Thibaudiaceae with the Vacciniaceae and discussed the union and some of the generic boundaries with some independence of thought and observation; my résumé of his work as it pertains to Peru is indebted to his considerable contributions.

GENERIC KEY

(Applicable not always precisely and only for Peruvian species)

Fruit, except *Gaylussacia*, 5 (2–3) -celled or more or less clearly 10-celled, the cells with few–many seeds; ovary entirely inferior.

  Flowers or leaves or both small, one or the other or both rarely 1 cm. long or some slightly longer; dehiscence usually by pores little or not longer than broad, rarely by long-oval clefts; calyx lobes, except in *Themistoclesia* and 1 species of *Eleutherostemon*, well-defined, ordinarily longer than broad.

    Pedicels solitary except *S. myrtifolium*, elongate, slender, not bracted terminally; trailing estipulate (or seemingly) slender-stemmed epiphytes; fruit (known) drying fragile, subtruncate at base, not costate-alate.....1. *Sphyrospermum.*

    Pedicels slender, usually racemose; shrubs, more or less erect; fruits drying fragile, attenuate at base and alate or stipules mostly obvious.

      Stipules small or obscure; calyx angled or alate; fruits (known) 5-alate.............................2. *Themistoclesia.*

Stipules aristate, persisting; calyx costate; fruits merely costate. 3. *Eleutherostemon.*

Pedicels more or less developed but rather stout; shrubs with succulent fruits or these drying coriaceous.

Pedicels obsolete or bracted terminally, at least minutely; stamens 8–10 .... 4. *Disterigma.*

Pedicels often obvious but not bracted terminally; stamens 6, 8, usually 10 .... 5. *Vaccinium.*

Flowers and leaves both with few exceptions (in Peru, *M. globosa, Sat. polyantha, Sat. Vargasii,* all with broad calyx lobes) at least about 1 cm. long, usually longer, often much longer; dehiscence by elongate chink or cleft, rarely by pore but not if the flowers are small.

Dehiscence by terminal or oblique pores; corolla cylindric or ventricose; stamens usually equal (subequal, *Periclesia;* filaments unequal, *Orthaea*), anther sacs granular or other characters for the section well developed.

Corolla ventricose at base, angled; pedicels articulate; filaments distinct .... 6. *Ceratostema.*

Corolla cylindrical, or nearly.

Filaments distinct, retrorsely pilose; pedicels continuous. 7. *Pellegrinia.*

Filaments often connate, sometimes with a few spreading trichomes; pedicels articulate.

Filaments connate; calyx lobes clearly defined or about as broad as long.

Pores terminal; calyx lobes broadly triangular, very short .... 8. *Siphonandra.*

Pores oblique; calyx lobes often elongate, sometimes 4. 9. *Periclesia,* 6. *Ceratostema.*

Filaments free unless basally; calyx lobes minute or not clearly demarcated .... 17. *Orthaea.*

Dehiscence usually by short clefts; corolla ample, deeply campanulate, broad .... 10. *Semiramisia.*

Dehiscence usually by more or less elongate clefts or chinks; anther sacs smooth or only slightly granular except *Macleania, Plutarchia;* calyx lobes usually short or not clearly defined.

Calyx lobes well defined, even if small; pedicels continuous except *Plutarchia*.

Tubules usually much longer than anther cells; calyx not alate............................11. *Demosthenesia*.

Tubules about twice longer than anther cells; calyx alate. 12. *Anthopterus*.

Tubules and anther cells more or less unequal; pedicels articulate; calyx alate (Peru)...........13. *Plutarchia*.

Calyx lobes usually poorly developed or defined, or rather rotund (see also *Plutarchia, Anthopterus;* pedicels articulate, sometimes obscurely, except *Anthopterus* [1 species, *Thibaudia*]); tubules usually less than twice as long as sacs.

Stamens equal; anther sacs strongly granular; tubules rigid, short...............................14. *Macleania*.

Stamens equal or nearly; anther sacs smooth or nearly; tubules more or less flexible.

Corollas alate to lobes, calyces to sinuses; pedicels continuous.........................12. *Anthopterus*.

Corollas angled, calyces alate to sinuses..13. *Plutarchia*.

Corollas cylindric or nearly; pedicels articulate except *Th. floribunda*....................15. *Thibaudia*.

Stamens evidently unequal; pedicels articulate.

Filaments unequal, distinct or nearly.

Anthers alternately unequal; large bracts usually present.......................16. *Cavendishia*.

Anthers equal; bracts rarely present......17. *Orthaea*.

Filaments completely connate.............18. *Satyria*.

Fruit a berry-like drupe with usually 10 nut-like seeds, the 5–10-celled ovary with a single ovule in each cell....19. *Gaylussacia*.

Fruit capsular, baccate or fleshy but ovary entirely superior.

Corolla with 6–7 free petals; fruit a 6–7-lobed capsule..20. *Bejaria*.

Corolla 5–6-lobed or dentate; fruit baccate or a 5–6-valved capsule.

Sepals more or less united; capsules fleshy or baccate.

Anthers basally awnless; calyx unchanged in fruit. 21. *Pernettya*.

Anthers aristate or tubulate; calyx enclosing capsule, usually accrescent..........................22. *Gaultheria*.

Sepals free, the calyx after anthesis unchanged; anthers awnless or bicuspidate dorsally....................23. *Leucothoe.*

SPECIES KEY TO THE PERUVIAN VACCINIACEAE

(Excluding *Vaccinium* and *Disterigma* except *V. Mathewsii, V. pseudocaracasanum*)

Trailing, slender-stemmed epiphytes with usually solitary tubular flowers (longer than broad), on axillary slender, usually solitary pedicels.

Leaves all suborbicular; stamens same number as flower lobes. *S. buxifolium.*

Leaves at least mostly somewhat longer than wide, usually slightly narrowed to tip; stamens ordinarily twice as many as flower lobes.

Leaves obtuse or obtusely short-acuminate, mostly or all shorter than 5 cm..............................*S. cordifolium.*

Leaves long-acuminate, mostly or all 5 cm. long or longer. *S. Weberbaueri, S. longifolium.*

Characters never all entirely as above or quite the same; for instance, the flowers may be campanulate, or little longer than broad.

Calyx lobes well defined, usually as long or longer than broad, about as long or longer than the calyx tube, or leaves serrate; dehiscence by terminal or subterminal pores or short chinks, the latter sometimes flaring, rarely elongate and more lateral.

Leaves or flowers or both to scarcely 2 cm. long, or the former sometimes much longer, the latter then much shorter.

Leaves more or less acuminate, but clearly so, or if shortly, serrate.

Leaves serrate, sometimes shortly acuminate; pedicels continuous; calyx angled or subglobose.

Racemes and leaves glabrous; corolla urceolate. *V. pseudocaracasanum.*

Racemes and leaves rather canescent; corolla subtubular. *V. Mathewsii.*

Leaves entire, acuminate, except *S. myrtifolium.*

Flowers several in racemes, conical-tubular or subcylindrical.

Branchlets glabrous; leaves 1–1.5 dm. long. *A. racemosus.*

Branchlets puberulent; leaves 4–6 cm. long. *El. laxum.*

Flowers 1–3 in the axils, campanulate.

Pedicels elongate .... *S. myrtifolium.*

Pedicels 4–7 mm. long .... *S. Büesii.*

Leaves obtuse or subacute, entire.

Leaves about elliptic; pedicels continuous; flowers 5-merous.

Pedicels elongating to 1 or 2 cm.

Pedicels rather rigid, to 12 mm. long .. *Dem. amicorum.*

Pedicels flexuose, to 2 cm. long .... *Dem. buxifolia.*

Pedicels 3–5 mm. long .... *Dem. Weberbaueri*

Leaves ovate-oblong; pedicels articulate, 6–8 mm. long; flowers 5-merous .... *Pel. Harmsiana.*

Leaves broadly ovate, subrotund; flowers 4-merous. *Pl. angulata.*

Leaves and flowers to several cm. long.

Calyx lobes 4, the tube winged .... *Pl. angulata.*

Calyx lobes 4, to 2.5 cm. long; pedicels articulate. *Per. flexuosa.*

Calyx lobes 5, to 1.5 cm. long; pedicels continuous.

Leaves deeply cordate.

Calyx strongly 10-costate .... *C. peruvianum.*

Calyx terete .... *C. callistum.*

Leaves obscurely if at all cordate.

Filaments tomentose; dehiscence terminal.

Leaves usually shorter than 4 cm. *Pel. coccinea, Pel. grandiflora.*

Leaves usually 4 cm. long or longer ...... *Pel. hirsuta.*

Filaments pilose; dehiscence by lateral clefts.

Corollas to 1 cm. in diameter .... *D. spectabilis.*

Corollas rarely 5 mm. in diameter .... *D. Mandoni.*

Calyx lobes often poorly defined, inconspicuous or as broad or broader than long; leaves entire or rarely crenulate; dehiscence usually by more or less lateral clefts except as noted, always if calyx lobes are long-triangular.

Leaves of flowering branches all or mostly shorter than 1 dm.

Leaves oblong or somewhat oblong-spatulate to clearly obovate, glabrous.
  Leaf base acute to cuneate, not truncate or subcordate.
    Leaves about three times longer than wide, at least many.
      Corollas 2.5 cm. long; dehiscence by pores. *Si. pilosa, Si. elliptica.*
      Corollas to 1 or nearly 2 cm. long; dehiscence by clefts.
        Calyx tube strongly ventricose...... *T. apophysata.*
        Calyx not at all ventricose.............. *M. nitida.*
    Leaves about twice as long as wide; corollas to 1.5 cm. long; dehiscence by clefts.
      Corollas glabrous within............... *T. ovalifolia.*
      Corollas pubescent within... *T. spathulata, T. obovata.*
  Leaf base subcordate or truncate, the leaves oblong.
    Leaves obtuse......................... *T. Engleriana.*
    Leaves acuminate.................. *O. pinnatinervia.*
Leaves, at least mostly, broadest about or below the middle or more or less farinose.
  Corollas usually thin, campanulate, to 2 cm. wide, 4 or 5 cm. long.
    Flowers binate; dehiscence by short clefts. *Semi. Weberbaueri.*
    Flowers racemose; dehiscence by pores. *Semi. pulcherrima.*
  Corollas fleshy, tubular or conical, rarely 4 cm. long, to about 5 mm. wide (see *C. amplexicaule* under *C. peruvianum*).
    Calyx as often corolla angled or alate; leaves often plinerved.
      Flowers 5-merous, glabrous or sparsely pilose.
        Corollas 2–4 cm. long, angled; pedicels stout, articulate.
          Corollas finally 4 cm. long........ *M. macrantha.*
          Corollas much shorter. *M. angulata, M. floribunda.*
        Corollas 3.5–10 mm. long, not angled; slender pedicels continuous.
          Corollas about 1 cm. long...... *Them. peruviana.*

Corollas about 5 mm. long..... *Them. mucronata.*

Flowers 4-merous, villous-tomentose..... *Pl. angulata.*

Calyx and corolla not angled.

Inflorescence glabrous or glabrate unless the flowers, rarely farinose; filaments free to connate.

Leaves acuminate.

Pedicels stout, articulate, to 8 mm. long; stamens 10, unequal, the dehiscence terminal or oblique.

Corollas 1 cm. long; leaves subplinerved. *O. breviflora.*

Corollas 1.5 cm. or longer; nervation subpinnate. *O. pinnatinervia.*

Pedicels slender, continuous, to 1.5 cm. long; stamens 6–8, equal, dehiscence lateral. *El. octandrum.*

Leaves obtuse to acute or obtusely short-acuminate.

Bracts not conspicuously developed.

Flowers several to many.

Anther sacs granular; leaves quite entire.

Leaves not at all obovate, glabrous in age. *M. nitida.*

Leaves rather obliquely obovate, farinose. *M. farinosa.*

Anther sacs smooth or nearly; leaves often a little crenulate.

Corollas rarely 11 mm. long.

Corollas glabrous within apically. *T. crenulata.*

Corollas pubescent within apically. *T. diphylla.*

Corollas usually longer.

Leaves about oblong, 1–2 cm. wide; corollas subglabrous. *T. angustifolia.*

Leaves ovate, 3 or more cm. wide.

Corollas 16 mm. long; filaments connate, smooth...... *T. Urbaniana.*

Corollas to 12 mm. long; filaments free, alternately spurred . *T. cupatensis.*

Flowers 1–2 together.

Leaves rarely 2 cm. long . . . . *T. biflora.*

Leaves 2.5–4 cm. long . . . . *T. uniflora.*

Bracts conspicuous, enclosing the flower buds. *Cav. bracteata.*

Inflorescence even after flowering somewhat pilose; filaments connate or loosely so (unknown for *T. cardiophylla*).

Leaves deeply cordate, ovate . . . . . . *T. cardiophylla.*

Leaves somewhat cordate, oblong . . . . *T. Engleriana.*

Leaves not at all cordate.

Leaves somewhat obovate . . . . *T. obovata.*

Leaves sublinear, sulcate-revolute . . . *T. tomentosa.*

Leaves elliptic, obtuse or rounded both ends. *Sat. Vargasii.*

Leaves somewhat narrowed both ends.

Leaves little widened medially, often much longer than wide . . . . *T. Moricandi.*

Leaves widened medially, often only 2–3 times longer than wide.

Flower buds not bract-enclosed; stamens equal, filaments connate.

Corolla 1–1.5 cm. long.

Leaves sparsely pilose to glabrous.

Corolla to 1.5 cm. long . . . *T. melliflora.*

Corolla to 1 cm. long . . . . *T. Herrerae.*

Leaves softly pilose beneath.

Leaves attenuate to base . *T. regularis.*

Leaves rounded at base . . . . *T. Rauhii.*

Corollas at most 5 mm. long. *Sat. polyantha.*

Flower buds somewhat enclosed in large bracts; stamens unequal, filaments free. *Cav. bracteata.*

Leaves of flowering branches all or many about 1 dm. long, usually some distinctly longer.

Leaves weakly if at all plinerved, long- or acutely acuminate or pubescent.
  Flowers paniculate, to 11 mm. long.......... *Cav. Martii.*
  Flowers racemose, subglobose, 3–4 mm. long... *Ps. globosa.*
  Flowers racemose, much longer than wide.
    Leaves about oblong, to 3.5 (4) cm. wide.
      Calyx as corolla not winged.
        Filaments glabrous, tubules 5 mm. long; indument rufous.......................... *O. ignea.*
        Filaments subpilose, tubules shorter; indument pale.
          Pedicels to 13 mm. long; calyx limb thick, sinuses acute..................... *O. Weberbaueri.*
          Pedicels to 20 mm. long; calyx limb thin, sinuses rounded..................... *O. Ferreyrae.*
      Calyx winged to sinuses, corolla to lobes. *A. racemosus.*
    Leaves elliptic, all or many wider than 3.5 cm.
      Leaves acutely subcaudate, glabrous.. *Cav. acuminata.*
      Leaves shortly acuminate, usually obtusely, or pubescent beneath.
        Corolla slender, scarcely wider than 3 mm.; leaves glabrous.................... *Sat. panurensis.*
        Corolla 4–6 mm. wide; leaves pubescent beneath.
          Leaf indument nigrescent; corolla about 15 mm. long...................... *Cav. peruviana.*
          Leaf indument canescent; corolla about 2 cm. long. *Cav. pubescens.*
Leaves strongly plinerved or if rarely pinnate obtuse or acute or obtusely short-acuminate unless *M. pauciflora.*
  Bracts at least early conspicuous; filaments unequal, free.
    Stems obviously wing-margined at least the flowering. *Cav. caulialata.*
    Stems terete, obscurely if at all margined.
      Flowers soon openly and finally long-racemose. *Cav. punctatifolia.*
      Flowers in short congested racemes. *Cav. Urbaniana, Cav. Ulei, Cav. nobilis.*

Bracts inconspicuous or undeveloped; filaments more or less connate or equal.

Leaves broadly oblong-elliptic, abruptly short-caudate; anthers as tubules 3 mm. long, connective spurred. *Ps. pauciflora.*

Leaves ovate-oblong-lanceolate, rather gradually if narrowly or shortly acuminate, rarely obtuse; anthers 5–7 mm. long, if connective spurred.

Leaves acuminate.

Leaves rarely 4 cm. wide; corolla thin, 2.5–3 cm. long; stamens unequal. *O. Engleriana, O. secundiflora.*

Leaves often 4 cm. wide or wider; corolla often rather fleshy.

Pedicels continuous; leaves usually oblong-lanceolate; filaments free, smooth; corolla about 16 mm. long.................*T. floribunda.*

Pedicels articulate; leaves usually broadly oblong- or ovate-lanceolate or ovate; corolla 2–3 cm. long.

Corolla subcylindric; filaments firmly connate. *Sat. panurensis.*

Corolla conical; filaments free; usually in part spurred.

Leaves to 7-plinerved, often 3–4 dm. long; connective spurs obscure. *Ps. Ulbrichiana.*

Leaves to 5-plinerved, often shorter than 2.5 dm.; connective spurs (sometimes solitary) obvious.

Calyx lobes 2–5 mm., tubules 3–4 mm. long. *Ps. guianensis, Ps. coarctata.*

Calyx lobes 6–8 mm., tubules 2–3 mm. long. *Ps. fissilis.*

Leaves obtuse or subacute.

Pedicels with 1–2 bractlets..............*M. nitida.*

Pedicels with several to many bractlets. *M. Benthamiana.*

1. SPHYROSPERMUM Poepp. & Endl.

Sophoclesia Klotzsch, Linnaea 24: 29. 1851.

References: A. C. Smith, Brittonia 1: 206. 1933; Sleumer, Notizbl. Bot. Gart. Berlin 13: 108–111. 1936; Bot. Jahrb. 71: 393–395. 1941.

Essentially *Themistoclesia* except for habit and vegetative character and like it properly a part of *Vaccinium,* sens. lat. Stipules none or indistinct. Flowers solitary with 4, 5, 8 or 10 stamens (rarely 6 or 7), the filaments longer than the anthers. Fruit a globose or ellipsoid capsule, neither winged nor costate, very fragile, apparently always pubescent, or a fleshy berry when fresh. Seeds so far as known elongate-scobiform, the testa striate, rarely reticulate. Besides the following the Ecuadorian *S. muscicolum* Hook. f. may occur; it belongs in the group with many stamens but the leaves are acute, pellucid, veiny. Nearly related to Asiatic plants; cf. Airy-Shaw, Kew Bull. 153. 1935. Descriptions largely after Smith.

Leaves all suborbicular; stamens same number as flower lobes. *S. buxifolium.*

Leaves at least mostly somewhat longer than wide, slightly narrowed at tip; stamens usually twice as many as flower lobes.
  Leaves obtuse or obtusely short-acuminate, mostly or all shorter than 5 cm.; capsules (known) subglobose.
    Branchlets puberulent; pedicels solitary........*S. cordifolium.*
    Branchlets hirsute; pedicels 1–3, elongate......*S. myrtifolium.*
    Branchlets hispidulous; pedicels 4–7 mm. long.......*S. Büesii.*
  Leaves long-acuminate, mostly or all 5 cm. long or longer; capsules (known) longer than broad....*S. Weberbaueri, S. longifolium.*

Sphyrospermum Büesii A. C. Sm. Journ. Wash. Acad. Sci. 43: 208. 1953.

Slender elongate branchlets hispidulous-pilose toward tips (trichomes to 1 mm. long) as petioles (about 1.5 mm. long); leaves oblong-lanceolate, obtuse or narrowly rounded at base, gradually acuminate, callose-obtuse, (2) 2.5–3 cm. long, 8–12 mm. wide, coriaceous, early sparsely pilose both sides, the basal 3–5 nerves as the veins immersed; inflorescence 1–2-flowered, the few basal bracts ovate-deltoid, acute, hispidulous, 1–2 mm. long; pedicels 4–7 mm. long, soon glabrate; calyx (early) 6 mm. long, 4 mm. across, tomentulose, the ellipsoid tube 2–3 mm. long, the longer papyraceous limb glabrous within, deeply 4–5-lobed, lanceolate lobes and sinus acute, 2–2.5 mm. long; disk subpulvinate, glabrous; corolla urceolate, 7–8 mm. long, strongly contracted (early) base and apex, with a few glandular trichomes above 0.1–0.3 mm. long, the 4 or 5 subacute lobes about 1 mm. long; stamens 8 or 10, glabrous, filaments 3, anthers 3.5 mm. long, cells 1.5–2 mm. long, subequaled by the slender tubules, the dehiscence by elongate chinks at least 1 mm. long.—After author, who compares it with *S. Sodiroi* (Hoer.) A. C. Sm. and *S. Haughtii* A. C. Sm. l.c. 207, both with broader leaves, shorter calyx, the former with glabrous corolla, the latter with shorter pedicels, longer corolla.

Cuzco: Yanatín Palmacocha, Prov. Convençion, 2,700 meters, (*Bües 2165*, type).

Sphyrospermum buxifolium Poepp. & Endl. Nov. Gen. & Sp. 1: 4. *pl. 8.* 1835; 207.

Slenderly branched epiphyte, the young branchlets ashy puberulent as the 1 mm. long petioles; leaves subcoriaceous, 8–17 (20) mm. long, nearly as broad, rounded both ends, obscurely 3–5-nerved from base, soon glabrous; pedicels glabrous or ashy pilose, usually 10–18 mm. long; calyx 4-lobed, the sinuses rounded; corolla white to pink, submembranous, 4–5.5 (6) mm. long, the 4 lobes minute; stamens 4, the filaments glabrous or villous, the tubules and cells subequal, the dehiscence by oblique or sublateral pores; fruit pilose or glabrous, to 6 mm. thick.—*S. ellipticum* Sleumer of Ecuador has leaves 28–37 mm. long, flowers 3.5 mm. long. F.M. Neg. 4723.

San Martín: Tarapoto, *Spruce 4435; Ule 6463; Williams 5984.*—Huánuco: Chinchao, *Ruiz & Pavón.* Pampayacu to Cuchero, *Poeppig*, type.—Junín: Chanchamayo Valley, *Raimondi; Schunke 281; A37; 345.* Pichis Trail, *Killip & Smith 25676.*—Ayacucho: Ccarrapa, *Killip & Smith 22494.* Bolivia to Central America.

Sphyrospermum cordifolium Benth. Pl. Hartw. 222. 1846; 213. *S. majus* Griseb. Fl. Brit. W. Ind. 143. 1859; 209 at least as to Peru.

Slender or rather stout, the branches rooting and subprostrate below; puberulent, especially the young parts, or glabrous; petioles 1–3 mm. long; leaves 2–5.5 (7) cm. long, 1.2–3 cm. wide, rounded or subcordate at base, obtuse or subacute, glabrous, 3–5-nerved from base, the veins often impressed above; pedicels 1–2.5 cm. long; calyx tube usually early villous, the 4–5 lobes often tufted setose at apex; corolla white to pale pink, 4.7–8 mm. long, usually glabrous; stamens

8 or 10 (7, 6 or 5), slightly unequal or subequal; anther tubules about twice as long as the cells; fruit subglobose, 4–7 mm. thick.—Mostly between 1,000 and 3,000 meters.

Cajamarca: Huancabamba, *Weberbauer 6135.*—Huánuco: Sariapampa, *Woytkowski 34269.*—Junín: Huacapistana, *Killip & Smith 24268.* Chanchamayo Valley, *Killip & Smith 24869.* Río Masamerich, *Weberbauer 6649.* Pichis Trail, *Killip & Smith 25871; 25905.*—Puno: Tatanara, *Lechler 2634; Gay.* Bolivia to Trinidad and Costa Rica.

Sphyrospermum longifolium Poepp. & Endl. Nov. Gen. & Sp. 1: 5. 1835; 216.

Creeping on trees with *S. buxifolium,* the straight branchlets subangled, the few elongate-lanceolate long-acuminate leaves spreading or reflexed, a dm. long or longer, only about 12 mm. wide, coriaceous, glabrous, lustrous, not at all revolute, sub 5-nerved, lustrous and veinless above, reticulate-veined beneath; peduncles axillary, solitary, 1-flowered, ebracteate, about 12 mm. long, nearly capillary, nodding; flowers small, white, like those of *S. buxifolium* but the ovary 4-celled; fruits ovoid, membranous, pubescent, the many ovate, acute, somewhat compressed seeds with reticulate testa.—Description after author, but it should be drawn, it seems to me, to include *S. Weberbaueri,* which is in all probability the same species, but in flower. According to Sleumer, Bot. Jahrb. 71: 394. 1941, the type in Vienna herb. is without flowers; the leaves suggested to him this genus but he questioned if the solitary flattish berry-like fruit belongs to the leaf-specimen.

Huánuco: Pampayacu and Cuchero, *Poeppig,* type. Huacachi near Muña, *4121.*—Junín: Hacienda Schunke, La Merced, *5664.* Agua Dulce, Prov. Tarma, *Woytkowski 35434.*

Sphyrospermum myrtifolium Hook. Icon. Pl. 2. *pl. 112.* 1837. *Vaccinium sphyrospermoides* Sleumer, Notizbl. Bot. Gart. Berlin 13: 137. 1936, not *Vaccinium myrtifolium* Michx.

Shrub with slender virgate conspicuously hirsute branches; leaves ovate-lanceolate, barely acute, apparently about 2.5 cm. long, half as wide near the base, entire but the margins revolute, coriaceous, lustrous and slightly veiny above, pale, dull and veinless beneath; pedicels 1–3 in the axils, hirsute, somewhat shorter than the leaves and more or less recurving; calyx obscurely articulate with pedicel, both densely pubescent, the teeth broadly ovate, acute, about as long as broad at base; flowers seemingly campanulate, 4–5-merous, often with 6 stamens; filaments shorter than the anthers, the tubule pores dilated, terminal, the spur short and broad but obvious, the anther sacs and tubules subequal, the former glandular.—Species with the aspect of *Sphyrospermum* and it must be regarded as aberrant and a connecting entity. There seems to be no reason for transferring this to *Vaccinium* since it is still a connecting species, at least until fruit is known.

Amazonas: Bagasán, (*Mathews 1466*, type).

Sphyrospermum Weberbaueri (Hoer.) A. C. Sm. Brittonia 1: 212. 1933. *Sophoclesia Weberbaueri* Hoerold, Bot. Jahrb. 42: 334. 1909.

A glabrous epiphyte with slender branches and branchlets, the petioles stout, 1 mm. long; leaves oblong, long-acuminate, 5–6 cm. long, 1.5–2 cm. wide, entire, 3–5-nerved, the nerves impressed above, prominent beneath; peduncles solitary, axillary, slender, nearly 2 cm. long, continuous with the calyx, this subglobose, 3 mm. long, its limb acutely 4–5-dentate; corolla tubular, inflated above (the limb contracted), 12 mm. long, the broadest part 2 mm. across, acutely 4-(rarely 5-) dentate; stamens 8, the slender free filaments glabrous, the anthers 1 mm. long with conical tubules twice as long opening by an oblique elongate pore; ovary 4-celled; style filiform; disk annular.—*S. grandifolium* Hoer. of Ecuador has corollas about 15 mm. long, the filaments about 9 mm. long. Other Ecuadorian species have short pedicels: *S. Spruceanum* Sleumer, flowers subsessile; *S. microphyllum* Sleumer, pedicels 3–4 mm. long; *S. Sodiroi* Hoer., pedicels 6–9 mm. long. F.M. Neg. 4730.

Junín: Yananga Mountains, east of Huacapistana, 2,500 meters, *Weberbauer 2122*, type.

2. THEMISTOCLESIA Klotzsch

References: Sleumer, Notizbl. Bot. Gart. Berlin 13: 108–111. 1936; Bot. Jahrb. 71: 389–392. 1941; Smith & Camp, Brittonia 2: 263–264. 1936.

Slender-stemmed, the subcoriaceous leaves usually subcordate at base, obscurely nerved, slightly petioled, the flowers in short axillary racemes, sometimes solitary or binate. Pedicels continuous with the short-cylindric or obconic calyx, this narrow or broad at base, narrowly 5-winged (or strongly angled) to sinuses, typically obvious even in anthesis, the calyx lobes erect. Corolla rather fleshy to thin, tubular to subglobose. Stamens 10 (5 or 8), alternately unequal or subequal, distinct, the anther sacs smooth, the slightly longer to twice as long tubules opening by short clefts. Pedicels bracteate.—Fruit like *Sphyrospermum* supposedly dry and fragile (Sleumer); more likely a berry in both genera (Smith & Camp). Apparently could as well be placed in *Thibaudia* sens. lat. or *Anthopterus* with *A. racemosa* but corolla not wing-angled and more the form of *Vaccinium*. Stipules small but usually obvious.

Leaves hispid beneath; calyx narrowed at base........*T. peruviana.*
Leaves glabrous; calyx broad at base................*T. mucronata.*

Themistoclesia mucronata (Benth.) Sleumer, Notizbl. Bot. Gart. Berlin 13: 110. 1936. *Anthopterus mucronatus* Benth. Pl. Hartw. 221. 1846. *T. Pittieri* Sleumer, l.c. fide Smith & Camp. *Vaccinium Benthamianum* A. C. Sm. Bull. Torrey Club 60: 110. 1933.

Branchlet tips spreading, hirsutulous; petioles dark, 2 mm. long; leaves crowded, elongate-ovate, rounded or obscurely cordate at base, gradually acuminate and acute, deciduously if at all mucronulate, 15–23 mm. long, 8–10 mm. wide, glabrous, coriaceous, distinctly margined, the impressed midnerve prominent beneath; racemes 2.5–4 cm. long with 11–16 flowers, the softly pubescent slender rachis with many ovate ciliate basal bracts 2–3 mm. long; pedicels about 8 mm. long, the narrow basal bractlet 3 mm. long, continuous with calyx, this fleshy, broad at base, 5-angled, nearly glabrous, minutely mucronate-dentate (Bentham); corolla whitish, subcylindrical, glabrous unless at tip pilose, 3.5–4 mm. long, lobed even to the middle; stamens 8, equal, 2.5–2.8 mm. long, the glabrous filaments 1 mm. long, the smooth sacs as long and about equaled by the tubules, these dehiscing by rather long introrse clefts; stigma truncate.—This is Sleumer's specimen (cf. synonymy above); in the Bentham plant the leaves are callous-mucronate, the rachis glabrous and not seen.

Amazonas: Chachapoyas, (*Mathews*). Colombia.

Themistoclesia peruviana A. C. Sm. Contr. U. S. Nat. Herb. 28: 442. 1932.

Branchlets, petioles and short racemes pilose, the brownish trichomes spreading; petioles about 2 mm. long; leaves ovate, cuneate at base, long-acuminate, 2–3.5 cm. long, 1–1.5 cm. wide, entire, glabrous or essentially so above, hispid beneath, 3–5-plinerved, the nerves impressed above, obscure as the reticulate veins beneath; rachis to 1 cm. long with many ovate bractlets at base 1 mm. long; pedicels slender, 5–8 mm. long; calyx tube obconic, narrowly winged to the sinuses, about 4 mm. long and 3 mm. across at top; corolla sparsely pilose toward tip, short-tubulose, narrowed at base, about 1 cm. long; stamens subequal, the short filaments glabrous, the anther sacs 3 mm. long, the tubules flexible, somewhat longer, their clefts half as long.—Closely related is *T. epiphytica* A. C. Sm. Journ. Arnold Arb. 24: 470. 1943, from adjacent Colombia, less hispid, pedicels 6–13 mm. long, filaments to 4 mm. long.

Huánuco: In sphagnum at Villcabamba, 1,850 meters, *4964*, type.

3. ELEUTHEROSTEMON Herzog

Diogenesia Sleumer, Notizbl. Bot. Gart. Berlin 12: 121. 1934, fide A. C. Smith.

Habit of *Themistoclesia* but sometimes trees, stamens 4–10.—Its significant characteristics, according to Smith, Contr. U. S. Nat. Herb. 29: 351. 1950, are the "persistent and minute stipules, non-articulate calyces, small flowers and sometimes elongate filaments and their subglobose, dry, easily shattered fruits." *E. laxum* was "keyed" by the author with species having articulate pedicels. The dry, fragile, subglobose fruit is apparently that of the scarcely distinct group except for shape.

Calyx lobes ovate-deltoid; stamens 10 (type)............*E. laxum.*
Calyx lobes minute, the fruit truncate; stamens 6–8 (type).
E. octandrum.

Eleutherostemon laxum A. C. Sm. Contr. U. S. Nat. Herb. 29: 352. 1950. *Thibaudia laxa* A. C. Sm. Contr. U. S. Nat. Herb. 28: 424. 1932. *Themistoclesia caudata* Sleumer, Notizbl. Bot. Gart. Berlin 12: 134. 1934, not *Vaccinium caudatum* Warburg, but *V. incarum* Sleumer, l.c. 13: 137. 1936. *V. laxum* (A. C. Sm.) Smith & Camp, Brittonia 2: 264. 1936. *Diogenesia laxa* (A. C. Sm.) Sleumer, Bot. Jahrb. 71: 396. 1941.

Small shrub with elongate sparsely puberulent branchlets; petioles thick, about 2 mm. long; leaves ovate, rounded or sometimes subcordate at base, more or less abruptly caudate-acuminate, 4–6 cm. long, 2–2.5 cm. wide, entire, glabrous except the slightly pilose midnerve beneath, this strongly impressed above the lateral nerves and veins prominent beneath; racemes puberulent-pilose, 5–7-flowered; pedicels slender, 1.5–2 cm. long, articulate(?) to the calyx, this typically pubescent, subglobose, contracted below the ovate-deltoid membranous lobes; corolla pilose or glabrous, tubular, 7–8 mm. long, inflated at base where 4 mm. thick; filaments as to type glandular pilose (Smith); anthers with tubules 5–6 mm. long, the latter little longer than the smooth sacs, the introrse chinks 1.5 mm. long.—Related to *T. rostrata* A. C. Sm. of Colombia according to Sleumer, who placed it in *Vaccinium* because the fruit seemed to be a berry but later retained it in his genus *Diogenesia*, with the fruit dry! *Them. caudata* Sleumer, l.c., the glabrous plant, may become *E. laxum* A. C. Sm. var. **caudatum** (Sleumer) Macbr., comb. nov.

Ayacucho: Between Quellacocha and Puytac, entrance to the montaña of Huanta, (*Raimondi 9873*, type, *T. caudata*). Choimacota Valley, *Weberbauer 7532*, type.

Eleutherostemon octandrum (Sleumer) A. C. Sm. Contr. U. S. Nat. Herb. 29: 352. 1950. *Thibaudia octandra* (Sleumer) Macbr. Univ. Wyo. Publ. 11: 40. 1944. *Diogenesia octandra* Sleumer, Notizbl. Bot. Gart. Berlin 12: 121. 1934. *Vaccinium octandrum* Sleumer, l.c. 13: 136. 1936.

Glabrous shrub, the bark of the branches smooth; leaves subsessile, long-ovate, rounded to subcordate at base, caudate-acuminate, mostly 4–6 cm. long, 1.5–2 cm. wide, entire, subcoriaceous, sparsely and minutely red-punctate beneath, midnerve above strongly impressed, lateral nerves obscure both sides; racemes 8–12-flowered; pedicels continuous(?), slender, 1–1.5 cm. long, glabrous as the calyx, this obconic-campanulate, 2–2.5 mm. long, the limb nearly truncate; corolla subcylindric, glabrous, 6–7 mm. long, 2 mm. thick, the 4–5 lobes about 1 mm. long; stamens 6–8, 5 mm. long, the membranous filaments pilose marginally; anthers slightly granular, 3.5 mm. long with the tubules, these subrigid dehiscing by clefts 0.5–1 mm. long.—*E. bolivianum* (Britton) Herzog has smaller leaves, denser inflorescence, puberulent pedicels and capsules. *E. amplectens* (Sleumer) A. C. Sm. (*Diogenesia amplectens* Sleumer, Bot. Jahrb. 71: 396. 1941) of Ecuador has deeply cordate leaves, 8–11 cm. long or longer, 4–6.5 cm. wide.

Puno: Tatanara, *Lechler 2614* (*4333*), type.—Cuzco: Cerro de Cusilluyoc, 2,800 meters, *Pennell 14098a*. To Colombia.

4. DISTERIGMA (Klotzsch) Niedenzu

Reference: A. C. Smith, Brittonia 1: 216–232. 1933.

Like *Vaccinium* but defined to include species that have 2–several bracts just at the base of the calyx. Pedicels obscurely articulate. Flowers 4–5-merous, 1–several in the leaf axils, often subsessile. Stamens free or basally connate. Anthers typically dehiscing by a long-oval cleft, sometimes, as interpreted, by an oblique pore. See joint key with *Vaccinium*, with which, apparently, it is naturally a part and sometimes with intangible connections with large-flowered species.

Apical pedicel bracts 2; stamens twice as many as flower lobes.
  Leaves obtuse or merely acute.
    Leaves all or mostly wider than 5 mm.
      Flowers 4-merous, puberulent within........*D. alaternoides.*
      Flowers mostly 5-merous, pilose within..........*D. ovatum.*
    Leaves rarely 5 mm. wide.
      Corolla subcylindric, at most 10 mm. long, often shorter.
        Leaves 2–5 mm. wide..................*D. empetrifolium.*
        Leaves rarely 1.5 mm. wide.............*D. Weberbaueri.*
      Corolla somewhat campanulate, 10–14 mm. long.
        D. pernettyoides.
  Leaves acuminate...........................*D. acuminatum.*
Apical pedicel bracts many, minute; stamens (type) 8.....*D. Ulei.*

Disterigma acuminatum (HBK.) Niedenzu, Bot. Jahrb. 11: 224. 1889. *Vaccinium acuminatum* HBK. Nov. Gen. & Sp. 3: 264. *pl. 249.* 1819; 229. *Gaylussacia microphylla* G. Don, Gen. Syst. 3: 859. 1834.

Compact shrub, rarely, if ever, 1 meter high, the few branches terete, the branchlets crowded and rather densely leafy, early more or less rusty hirtellous; leaves ovate, rounded at base, cuspidate or shortly acuminate, entire or obscurely crenulate, glabrous, subcoriaceous, paler beneath, faintly 5-nerved, 5–12 mm. long, 3–7 mm. wide; flowers axillary, solitary or sometimes geminate, the bibracteate pedicels 0.5–1.5 mm. long; bracts broadly ovate, rounded, obtuse, glabrous; calyx teeth 4, ovate, acute, glabrous, about 1.5 mm. long and broad, the corolla subcylindric, 5–8 mm. long, white, the throat constricted, the 4 teeth soon reflexing; stamens 8, included or exserted, the filaments pilose, the anthers smooth, with tubules slightly longer than the cells (Smith); fruit subglobose, coriaceous or fleshy, about 5 mm. in diameter.—Description after Bonpland. Corolla, fide Smith, often minutely brown pilose without, faintly puberulous within. Sleumer, Notizbl. Bot. Gart. Berlin 12: 282. 1935, remarked the identity, in all probability, of the species of G. Don and the Ruíz and Pavón specimen in herbaria as "*V.? microphylla.*" F.M. Negs. 4639; 38234.

Huánuco: Pillao, *Ruíz & Pavón* (type, *G. microphylla*). To Colombia.

Disterigma alaternoides (HBK.) Niedenzu, Bot. Jahrb. 11: 224. 1889; 219. *Vaccinium alaternoides* HBK. Nov. Gen. & Sp. 3: 265. 1819. *Metagonia alaternoides* (HBK.) Nutt. Trans. Am. Phil. Soc. N. S. 8: 266. 1843.

Compact, to 4 meters high, the branchlet tips, petioles and pedicels, as sometimes the young leaves, early slightly puberulent; petioles 1–3 mm. long; leaves ovate, obtuse or barely acute, entire, obscurely 5-nerved from base, 1.5–2.5 (3) cm. long, 8–15 mm. wide; pedicels to 2.5 mm. long, usually shorter, the apical bracts round-ovate, sometimes ciliolate, 2–4 mm. long; flowers 4-merous, glabrous without, often puberulent within, greenish-white to pink, 4.7–7.5 mm. long, the lobes reflexed at maturity; stamens often exserted, the distinct filaments 2.5–4.5 mm. long and more or less villous; smooth anthers and tubules subequal; fruit coriaceous to 4 mm. thick, the calyx persisting.—The variant *parvifolia* (Benth.) A. C. Sm. in herb. (*V. alaternoides* var. *parvifolium* Benth. Pl. Hartw. 140. 1844; *Vacciniopsis tetramera* Rusby, Descr. New S. Am. Pl. 77. 1920, fide Smith, l.c. 220) has leaves 10–17 mm. long, 5–10 mm. wide. *D. Popenoei* Blake from near Loja, Ecuador, has more strongly nerved leaves, ovate at base, and puberulent corollas. *D. pallidum* A. C. Sm. l.c. 222 from northern Bolivia has corollas 10–12 mm. long that are often contracted distally, and very slender filaments. F.M. Neg. 4764.

Cajamarca: Near Ayavaca, *Bonpland*, type. Jaén, *Weberbauer 6109*.—Amazonas: Chachapoyas, (*Mathews*).—Huánuco: Monzón, *Weberbauer 3546*. Playapampa, *4488*.—Junín: Huacapistana, *Weberbauer 2080*.—Cuzco: Sandía to Chunchusmayo, *Weberbauer 1089; 1339*. Bolivia to Venezuela.

Disterigma empetrifolium (HBK.) Drude in Pflanzenfam. 4, Abt. 1: 52, *pl. 32*. 1889; 223. *Vaccinium empetrifolium* HBK. Nov. Gen. & Sp. 3: 263, *pl. 248*. 1819.

Low, more or less spreading shrub, sometimes attaining several dm., again, at higher altitudes, prostrate, matted and only a few cm. high; branchlets subterete, early somewhat pubescent; leaves imbricate, subsessile, oblong-ovate to lanceolate or nearly oblong, subacute at both ends or usually more or less rounded at base, 5–12 mm. long, 2–5 mm. wide, coriaceous, dull, glabrous or nearly, slightly or obsoletely crenate and with several nerves from near the base, these often obscure; pedicels glabrate, 0.5–11 mm. long; bracts 2.5–3.5 mm. long; flowers 4-merous, glabrous or nearly, the acutish calyx lobes usually ciliolate, the subcylindrical corolla 6–9 mm. long; filaments 8, free, slender, somewhat pilose, sometimes scarcely, the anther tubules usually longer than the cells, dehiscing by oblong-oval introrse clefts; fruit white, to 12 mm. thick.—Description and determinations mostly after Smith, who notes the altitudinal range as 2,100 to 4,200 meters. The name has appeared by error in literature as *D. empetriformis* (HBK.) Drude. Illustrated, Weddell, Chloris And. 2. *pl. 73.* F.M. Negs. 4640; 4641.

Cajamarca: Near Hualgayoc, *Weberbauer 4008.* Near Huancabamba, *Weberbauer 6084.* Chota to Ninabamba, *Raimondi.* Celendín, *Osgood & Anderson 89.*—Huánuco: Mito, *1815.* Tambo de Vaca, *4453.*—Junín: Huacapistana, *Weberbauer 2213.*—Ayacucho: Cueva de Putac, *Raimondi.*—Cuzco: Valle de Paucartambo, *Raimondi; Soukup 390.*—Puno: Agapata to San Gován, *Raimondi.* Sachapata, *Lechler.* Colombia; Ecuador.

Disterigma ovatum (Rusby) Blake, Journ. Wash. Acad. Sci. 16: 365. 1926; 221. *Vacciniopsis ovata* Rusby, Bull. Torrey Club 20: 434. 1893, not *Vaccinium ovatum* Pursh.

Resembles *Vaccinium alaternoides* in habit, leaves and pubescence but the scarlet flowers are mostly 5-merous and uniformly pilose within, about 6 mm. long, the lobes obtuse; filaments usually 10 and coherent at base; anthers dehiscing by an oblong oblique cleft nearly half as long as the rigid tubes which subequal the sacs; ovary 5-celled. —This species is probably confined to southern Peru and adjacent Bolivia and therefore, in spite of the slight differences that separate it from its ally, it is apparently established as distinct within the much broader range of the species it so closely simulates. It seems from the anther orifice to approach *Thibaudia.*

Puno: Tabina, *Lechler 2113.* Bolivia.

Disterigma pernettyoides (Griseb.) Niedenzu, Bot. Jahrb. 11: 224. 1889; 227. *Vaccinium pernettyoides* Griseb. ex Wedd. Chloris And. 2: 179. 1860.

Low (to about 3 dm. tall), compact, often resembling *V. empetrifolium* in habit but the corolla rather campanulate, enlarged above to a diameter of 5 or 6 mm., 10–14 mm. long; leaves oblongish, 7–10 mm. long, 1.5–3 mm. wide, entire or obscurely crenate and 3-nerved from the base; pedicels 1–3 mm. long, the bracts 3–4 mm. long; calyx lobes ovate, subacute; filaments spreading pilose; anther cells and tubules subequal, the latter elongate, parted and dehiscing by long-oval introrse clefts.—An attractive under-shrub with white narrowly campanulate nodding flowers. Often in sphagnum among coarse grasses and taller shrubs, rooting at underground nodes and thus spreading some distance from parent plant (Balls). *D. codonanthum* Blake of Ecuador, similar, has shorter corolla, the stamens exserted. A stamen is illustrated by Weddell, l.c. *pl. 73.*

Cuzco: *Gay.* Accanaco, Paucartambo, *Balls 6703* (det. Killip). Valle de Pillahuata, *Herrera 3338; West 7079* (det. Johnston).—Puno: Tabina, *Lechler 2113a,* type. Sachapata, *Lechler 2587.* Bolivia.

Disterigma Ulei Sleumer, Bot. Jahrb. 71: 397. 1941.

Glabrous epiphyte with densely leafy subangled branchlets, the leaves elliptic-obovate, gradually narrowed to base, rounded at tip, 18–22 mm. long, 8–12 mm. wide, fleshy, the 3 nerves (these from base) as the mid-nerve obscurely developed; petioles stout, 2 mm. long; flowers axillary, solitary, sessile; bracts many, ovate, obtuse, scarcely 1 mm. long, enclosing base of calyx; calyx tube obconic, 2.5 mm. long, laxly pilose, broadly 4-dentate; corolla purple, glabrous, 3.5 mm. long, shortly 5-lobed; stamens 8, about 2.5 mm. long, the filiform glabrous filaments about 0.5 mm. long, the granulate sacs 0.8 mm. long, the slender tubules 1.2 mm. long, apically dehiscing by an oblique pore.—With *D. pentandrum* Blake, 331, of Ecuador, likewise with minute bracts, this is a species showing the essential union of the genera *Disterigma* and *Vaccinium.*

Loreto: Cerro de Escalero (north of Tarapoto), 1,200 meters, (*Ule 6448,* type).

Disterigma Weberbaueri Hoerold, Bot. Jahrb. 42: 334. 1909; 227.

Branched, apparently erect, to 5 dm. tall; branchlets terete, the younger pubescent; petioles stout, 0.5 mm. long; leaves linear-lanceolate, entire or subcrenulate toward the acute tip, 6–8 mm. long, 1–1.5 mm. wide, venose, the midnerve little prominent beneath; flowers solitary or geminate at the very leafy branchlet tips; pedicels nearly 2 mm. long, medially bracted, continuous but with 2 ovate-rounded bracts about 3 mm. long subtending the calyx, this globose-campanulate, the lower part 2 mm. long, the 4 lobes acute, erect-spreading and as long; corolla membranous-fleshy, tubular, contracted at base, subventricose, 9–10 mm. long, 3–4 mm. thick, the acute lobes spreading or reflexed; stamens 8, included, the filaments free or lightly cohering, pubescent; lower part of anthers 2 mm. long, the narrow tubules half as long, dehiscing by an oblique elongate pore; ovary 4-celled; style filiform; disk annular.—F.M. Neg. 4643.

Junín: West of Huacapistana, 3,000 meters, *Weberbauer 2079*, type.

5. VACCINIUM L.

References: Sleumer, Notizbl. Bot. Gart. Berlin 13: 111–140. 1936; Bot. Jahrb. 71: 410–427. 1941.

Shrubs, or rarely tree-like, in Peru commonly low and dense in habit. Leaves entire to crenate or serrate. Stipules obsolete or obvious and more or less persisting. Flowers characteristically small and urceolate to campanulate, rarely cylindric, usually in short racemes, fasciculate or less frequently solitary, often bracted and bibracteolate, the bracts sometimes foliaceous. Pedicels continuous or articulation usually obscure. Stamens 8 or 10, rarely 5 (exceptionally 4, 6 or 7), equal or essentially, exserted or included, the short or long glabrous to hirsute filaments free or nearly, the anthers spurred or spurless, rarely granular, with or without tubules, these flexible or rigid, the dehiscence terminal or oblique by more or less flaring pores or rarely clefts (these open at tip or exceptionally closed and the tips continued), sometimes by short lateral or subterminal oval porelike clefts. Disk variously developed. Fruit 4–10-celled, often a berry or if dry more or less coriaceous.

Genus widely distributed in the North Temperate zone and in the mountains of the tropics and as interpreted here, after Sleumer, could readily include other groups whose diagnostic characters are really only extreme variations of those now admitted in *Vaccinium* even by Sleumer, an interpretation perhaps subject to revision. See also Camp, Brittonia 4: 189–204. 1942, for an illuminating paper concerning the North American species, but probably similar genetic incidence is inherent in *Vaccinium* populations—and no doubt in other generic circles—also in Peru.

Besides the following, *V. meridionale* Swartz has been reported from Peru on the basis of a Mathews specimen from Chachapoyas which I have not seen. Since the Swartz species is otherwise known only from Jamaica, Venezuela, and Colombia, it seems probable that the Peruvian specimen is rather referable to the similar *V. corymbodendron* or possibly to *V. Mathewsii.* Sleumer, Notizbl. Bot. Gart. Berlin 13: 117, omits it from Peru. It differs from the former in more prominent anther spurs and longer leaves, these 2–3 cm. long, 10–22 mm. wide; since these are differences of degree, *V. corymbodendron* may prove, with the finding of intermediate forms, to be only a variety. The more obscure leaf-venation probably distinguishes it better from *V. Mathewsii.*

KEY TO VACCINIUM sens. lat.

(Including *Disterigma,* the latter with descriptions, pp. 69–73).

- Flowers only 1–3 (rarely –6) in the axils or branchlet tips; pedicels continuous with the calyx or short and apically bracted, the bracts usually only 2; tubules various.
  - Bracts lacking, the pedicels more or less elongate; anther tubules often short, broad.
    - Stamens included; leaves entire; calyx 4-lobed.... *V. dependens.*
    - Stamens exserted; leaves remotely crenate; calyx 5-parted. *V. didymanthum.*
  - Bracts more or less obvious, the pedicels short or lacking; anther tubules narrow.
    - Leaves acuminate or cuspidate, 5–12 mm. long. . *D. acuminatum.*
    - Leaves rounded apically to merely subacute.
      - Flowers distinctly inflated-campanulate, 10–14 mm. long. *D. Weberbaueri, D. pernettyoides.*
      - Flowers subcylindric, rarely 1 cm. long.
        - Leaves 1–5 mm. wide.
          - Leaves 2–5 mm. wide................ *D. empetrifolium.*
          - Leaves rarely 1.5 mm. wide........... *D. Weberbaueri.*
        - Leaves 8–16 mm. wide.
          - Flowers pedicelled, 5–7 mm. long.
            - Flowers 4-merous; filaments free...... *D. alaternoides.*
            - Flowers usually 5-merous; filaments coherent at base. *D. ovatum.*
          - Flowers sessile, 3.5 mm. long.................. *D. Ulei.*

Flowers several in racemes, these sometimes short or fascicled; pedicels articulate; anther tubules long, narrower than the sacs; leaves never strictly entire, the nerves, if obvious, pinnate.

Leaf-nerves more or less impressed above, obscure beneath.

Anthers spurred dorsally; fruit more or less 10-celled. *V. corymbodendron.*

Anthers smooth or spur rudimentary; fruit 5-celled. *V. floribundum.*

Leaf-nerves more or less prominent both sides; fruit 5-celled; anthers spurless.

Leaves drying dark brown, glabrous, lustrous.

Leaves 10–13 mm. long, 4–6 mm. wide.......... *V. crenatum.*

Leaves 2–3.5 cm. long, 1–2 cm. wide.. *V. pseudocaracasanum.*

Leaves yellowish-brown, more or less pubescent.. *V. Mathewsii.*

Vaccinium corymbodendron [R. & P.] Dunal in DC. Prodr. 7: 569. 1839; 127. *Metagonia corymbodendron* [R. & P.] Nutt. Trans. Am. Phil. Soc. N. S. 8: 264. 1843.

Branches erect, rigid, rugose, brown; leaves shortly petioled, ovate or ovate-oblong, 1.5–2 (2.5) cm. long, 8–10 (12) mm. wide (Sleumer), pinnately nerved, remotely and shortly denticulate, green and glabrous above, obscurely roughened and brownish beneath; racemes few-flowered, axillary and terminal; flowers 5-merous; calyx bibracteolate, the corolla twice as long; stamens included, the filaments hirsute, the anthers biaristate.—Description after Dunal. Has been cited as a plate, by Ruíz & Pavón, vol. 4 (no text), Fl. Peruv., but is not in the copy seen by me at the University of California. Perhaps should include *V. floribundum.* F.M. Neg. 4614.

Huánuco: Pillao, *Ruíz & Pavón,* type. Near Huánuco, *Kanehira 237.* Playapampa, 3,000 meters, *4489.* On Río Chinchao, *5149.* Colombia; Mount Roraima. "Congama."

Vaccinium crenatum (Don) Sleumer, Notizbl. Bot. Gart. Berlin 12: 291. 1935; 133. *Gaylussacia crenata* G. Don, Gen. Syst. 3: 859. 1834. *V. attenuatum* Dunal in DC. Prodr. 7: 571. 1839. *V. secundum* Klotzsch, Linnaea 24: 62. 1851, fide Sleumer, as also *V. reflexum* Hook. f. Bot. Mag. *pl. 5781.* 1869. *V. reclinatum* Niedenzu, Bot. Jahrb. 11: 224. 1889.

Branches elongating, virgate, decumbent or pendulous, shortly subhispid or glabrate, densely leafy; leaves subsessile, spreading or reflexing, oblong- or ovate-lanceolate, acute, sharply or obtusely serrate above the base, coriaceous, green or purplish above, glabrous, reticulate-veined on both sides, paler beneath, to 12 mm. long, 3–6 mm. wide; flowers in subterminal or axillary corymbs, the short peduncles bracteate, the pedicels caducously bibracteolate, to 4 mm. long; calyx lobes 5, ovate, acute, more or less coriaceous, the red urceolate 5-angled corolla (about 5 mm. long) with small obtuse teeth; stamens equal, the broad filaments ciliolate, the anthers smooth but auricled at base, dehiscing by oval introrse clefts.—Description in part after Hooker f., his type by Pearce not necessarily from Bolivia. Illustrated, Bot. Mag. *pl. 5781* (as *V. reflexum*). F.M. Negs. 7026 (*V. attenuatum*); 28933.

Cajamarca: Cutervo, *Raimondi.*—Junín: Near Punto, *Raimondi.* Huassahuasi, *Ruíz & Pavón*, type (as "*T. virgata*"). East of Palca, 2,800 meters, *Weberbauer 2441.* Upper Marañón, (*Warscewicz*, type, *V. secundum*, not from Central America as per Hemsley, Sleumer notes). Ecuador; Venezuela; Bolivia? "Huamapinta."

Vaccinium dependens (Don) Sleumer, Notizbl. Bot. Gart. Berlin 12: 291. 1935; 137. *Gaylussacia dependens* G. Don, Gen. Syst. 3: 859. 1834. *V. terniflorum* Dunal in DC. Prodr. 7: 575. 1839. *Disterigma terniflorum* (Dunal) Niedenzu, Bot. Jahrb. 11: 224. 1889. *Metagonia terniflora* (Dunal) Nutt. Trans. Am. Phil. Soc. N. S. 8: 265. 1843.

Branches terete or, according to Don, angled cicatrisate, the brownish branchlets pubescent; leaves shortly petioled or subsessile, ovate-oblong, attenuate at both ends, subretuse or acute, mucronate, fide Don, veinless, glabrous and green above, pale brown beneath, fasciculately hairy punctate, 12–14 (25, fide Don) mm. long, 8 mm. wide; flowers axillary, crowded, the geminate or ternate 1-flowered pedicels broadly bracted, glabrous as the calyx, this with 4 ovate acute lobes; anthers smooth.—After Dunal. Type entity variously given, perhaps from Churupallana near Tarma, by Ruíz and Pavón; it is probably wrongly labeled in some herbaria where perhaps even a different plant, apparently a *Gaultheria* species. F.M. Negs. 8509; 28936.

Huánuco: Between Chaglla and Muña, 2,500 meters, *Weberbauer 6703.* Pillao, Chachahuasi or Vitoc, *Ruíz & Pavón*, type.—Junín: Chanchamayo, *Isern 271.* Carpapata, *Killip & Smith 24431.* "Sachsauro" (Ruíz & Pavón).

Vaccinium didymanthum Dunal in DC. Prodr. 7: 575. 1839; 125. *Metagonia didymantha* (Dunal) Nutt. Trans. Am. Phil. Soc. N. S. 8: 265. 1843.

Branches puberulent; leaves numerous, crowded, petiolate, ovate-elliptic or oblong-elliptic, coriaceous, glabrous, remotely crenate-dentate, lucid above, pale beneath, acutish, the terminal rubescent; pedicels geminate, axillary, 1-flowered, about 5 mm. long, enlarged apically; calyx lobes 5, acute, glabrous; corolla tubular-ventricose, 4 mm. long, semi-parted, the lanceolate-oblong lobes reflexing; filaments long filiform, glabrous, the anthers awnless, exserted (Dunal). —F.M. Neg. 28937.

Amazonas: Chachapoyas, *Mathews*, type. Above Balsas, 3,000 meters, *Weberbauer 4283*. At the mines of S. Tomas, *Raimondi*.

Vaccinium floribundum HBK. Nov. Gen. & Sp. 3: 266. *pl. 251*. 1819; 129. *V. crenulatum* Dunal in DC. Prodr. 7: 569. 1839. *V. marginatum* Dunal, l.c. 570. *V. ramosissimum* Dunal, l.c. 571. *V. Tatei* Rusby, Phytologia 1: 71. 1934. *V. floribundum* var. *ramosissimum* (Dunal) Sleumer, l.c. 131, var. *marginatum* (Dunal) Sleumer, l.c., and var. *Tatei* (Rusby) Sleumer, l.c. 132.

Sometimes a shrub to 3 meters high, again dwarf, the stems even prostrate and only 3 dm. long; leaves crowded more or less in 2 rows in typical form, elliptic, slightly narrowed at both ends, minutely serrulate, 1–1.5 (1.8) cm. long, about 5 mm. wide, in var. *marginatum* to 8 mm. wide, rounded at base, in vars. *ramosissimum* and *Tatei* at most 1 cm. long, in the former 7–10 mm. and more or less narrowed at both ends, in the latter about 6 (–8) mm. long, subrotund-elliptic, rounded at both ends, the veins in all forms obscure, impressed above, scarcely obvious beneath; flowers 4-merous, 5–8 mm. long, the corolla short-cylindric, at anthesis somewhat inflated medially, narrowed at the mouth; filaments pilose; anthers spurless dorsally or the spur obsolete, the sacs and tubules subequal, the dehiscence by an oblique long-oval introrse cleft; berry black, more or less edible, sometimes large and well-flavored (*West 6438* from rocky summit of Huanga Picchu, Cuzco).—Species toward *Themistoclesia* in anther dehiscence and only by habit and terete calyces distinguishable. The most common species in Peru, only a few of the many collections being cited. F.M. Negs. 7025 (*V. ramosissimum*); 8511 (*V. crenulatum*); 38235.

Piura: Huancabamba, *Weberbauer 6049*.—Cajamarca: Near Ayavaca, *Bonpland*, type. Hualgayoc, San Miguel and Nanchó, *Raimondi*.

Cutervo, *Raimondi* (var. *marginatum*).—Amazonas: Chachapoyas, *Raimondi; Mathews* (type, *V. marginatum, V. crenulatum*); *Mathews* (var. *ramosissimum*). Between Chachapoyas and Cajamarca, *Raimondi* (var. *Tatei*).—La Libertad: Portachuelo, 3,900 meters, *West 8146* (var. *Tatei*, det. Johnston).—Ancash: Above Caraz, 3,400 meters, *Weberbauer 3231*.—Huánuco: Below Muña, *Raimondi*. Pampayacu, *Kanehira 248; Sawada P.19*. Monzón, 3,300 meters, *Weberbauer 3374*. Pillao, *Ruíz & Pavón* (type, *V. ramosissimum*); *Woytkowski 34038*. Near Mito, *1614; 1828; 2153*.—Junín: Huacapistana, *Weberbauer 2215*. Palca, 2,800 meters, *Weberbauer 2455*.—Apurímac: Above Río Pinco and Río Apurímac, *Weberbauer 5871*.—Cuzco: Above Yanamanche, *Weberbauer 4949*. Marcapata, *Vargas 9668*. Valle de Pillahuata, *Herrera 3340; 3664* (var. *ramosissimum*). Paso de Tres Cruces, *Pennell 13835*. Panticalla Pass (*Cook & Gilbert 1841*; var. *marginatum*). Prov. Urubamba, *Metcalf 30737* (det. Leonard). Acanacu Pass, *West 7033*.—Puno: Sandía to Chunchusmayo, *Weberbauer 1097* in part. Prov. Carabaya, *Raimondi* (var. *ramosissimum*). Sachapata, *Lechler 2702*. Bolivia to Venezuela; Central America? "Macha-macha," "congama" (Ruíz & Pavón).

Vaccinium Mathewsii Sleumer, Notizbl. Bot. Gart. Berlin 13: 134. 1936. *V. serratum* (Dunal) Sleumer, l.c. 12: 139. 1934, not Wright. *Thibaudia serrata* Dunal in DC. Prodr. 7: 563. 1839.

Branches leafy, terete, yellowish or toward the tips ashy puberulent; leaves petiolate, oval-elliptic, somewhat rounded at base, somewhat acuminate, thickly serrate, reticulate, drying yellowish-brown, early rather densely and finely pubescent, or apparently sometimes glabrate, 1.5–2.5 cm. long, 9–17 mm. wide (Sleumer); racemes simple (pedicels to 1 cm. long), axillary, efoliate, strigillose with crisped trichomes as the angled calyces, these (with lobes) about 6 mm. long, 4 mm. broad, the reddish ovate acute lobes 2.5–3 mm. long, corolla finally about 8 mm. long, subglabrous without, 5-toothed, tubular-ventricose; anthers spurless, tubules slender, orifice oval, slightly oblique.—F.M. Negs. 8604; 20045.

Amazonas: Chachapoyas, *Mathews*, type; 4 km. north of Chachapoyas, *Metcalf 30807? Williams 7553*.

Vaccinium pseudocaracasanum Sleumer, Notizbl. Bot. Gart. Berlin 12: 139. 1934.

Branchlets gray puberulent as also the petioles, these 2–3 mm. long; leaves ovate-oblong, more or less rounded at base, gradually acuminate, 2–3.5 cm. long, 1–2 cm. wide, coriaceous, glabrous, evidently serrulate, the nerves and veins both sides, especially beneath, reticulate; racemes 10–15-flowered, 2.5–6 cm. long, glabrous; calyx subglobose, glabrous, the lobes about 3 mm. long; corolla urceolate, glabrous, 5–6 mm. long, 2 mm. thick; stamens 10, equal, the sparsely pilose filaments 2 mm. long; anthers smooth, the tubules about as long as the sacs, the dehiscence by elongate introrse pores.—Flowers dark rose-colored. On account of the dehiscence seems to connect with *Themistoclesia.* See also *V. Mathewsii,* apparently very near.

Amazonas: East of Chachapoyas, 2,000 meters, (*Weberbauer 4347,* type).

6. CERATOSTEMA Juss.

Reference: A. C. Smith, Mem. N. Y. Bot. Gard. 8: 57. 1952.

Shrubs, sometimes epiphytic or, apparently, scandent with small or rarely ample pinnate or plinerved leaves and usually short few-flowered racemes, the pedicels ordinarily articulate, the calyx strongly costate or wing-angled or sometimes terete, the lobes more or less conspicuous, rarely small and even broader than long, even nearly as long as corolla, this, with one exception, apophysate or much enlarged basally, angled and the lobes then narrow and suberect. Stamens 10, nearly as long as corolla, equal or alternately slightly unequal. Filaments distinct or lightly cohering at base, or rarely early coherent, glabrous or puberulent, the cells usually coarsely granular and much shorter than the slender, rarely rigid tubules, these dehiscing by oblique or subterminal pores, these sometimes oval or flaring.

This is the earliest name (1789) applicable as noted elsewhere to a number of species groups by slight enlargement of definitions. Cf. *Periclesia,* recently included here by author.

Calyx terete, the lobes narrowly lanceolate .... *C. callistum.*
Calyx costate, the lobes ovate .... *C. peruvianum.*

Ceratostema callistum A. C. Sm. Journ. Wash. Acad. Sci. 46: 113. 1956.

Epiphyte, the branches from a tuber to 2 dm. in diameter, the branchlets as petioles (4–5 mm. long) hispidulous; leaves ovate, cordate, 6–9 cm. long, 3.5–5 cm. wide, narrowed to a callosed acumen 1–1.5 cm. long, early softly pilose and above with some glandular trichomes, the indument persisting beneath, the mostly 3 lateral nerves there elevated; inflorescence racemose in the upper axils, apparently 4–8-flowered, the soft pubescence in part glandular; bracts papyraceous, lanceolate, 5–8 mm. long; pedicels 10–18 mm. long, articulate with calyx, bracteolate toward the middle; calyx 2–2.5 cm. long, about 1.5 cm. across at apex, as pedicels glandular and eglandular pilose, the cupulate tube about 5 mm. long and wide, the suberect limb deeply 5-lobed, the lobes lanceolate, 14–17 mm. long; corolla cylindric, rather thin, pubescent as calyx and carmine red without, greenish and glabrous within, the subulate lanceolate lobes 10–12 mm. long; stamens slightly exserted, filaments glabrous, coherent in a tube 7 mm. long, the conspicuously granular anthers about 4 cm. long, cells 11 mm. long, the slender tubules 29 mm. long, dehiscing by oval subapical pores 1 mm. long.—Closely related only to *C. peruvianum* Gmel. and *C. pensile* A. C. Sm. from both of which it differs in its lanceolate calyx lobes. The collectors noted it as a frequent epiphyte in a beautiful forest, chiefly *Podocarpus*, near the Hacienda Taulis.

Lambayeque: Chiclayo, 2,500 meters, (*Rauh & Hirsch 2186*, type).

Ceratostema peruvianum Gmelin, Syst. Nat. 2: 676. 1791; 347.

Branchlets becoming glabrous; petioles about 3 mm. long; leaves ovate, deeply cordate, shortly acuminate, entire, 5–8 cm. long, 3–4 cm. wide, glabrous except for puberulence on the nerves above, softly pilose beneath; racemes 3–5-flowered, solitary or at tip of branchlets; rachis rigid, thick, 3–4 cm. long, pilose as the pedicels, these 2.5 cm. long, inarticulate; calyx turbinate, before anthesis evidently 10-costate, the tube about 5 mm. long, the lobes membranous, ovate-deltoid, 1–1.5 cm. long, 6 mm. wide or wider at base; corolla described as 5-winged, 37 mm. long, the lobes 12–20 mm. long; stamens unknown in type.—Description after Sleumer. *Solis 11133*, Pichincha, has pilose 5-costate corollas 3 cm. long, stamens glabrous, anther sacs nearly smooth, 6 mm. long, tubules slender, 12 mm. long, pores minute, subterminal. Other known species with deeply cordate leaves are *C. amplexicaule* A. C. Sm. Journ. Arnold Arb. 24: 462. 1943, from Putumayo region, and of course to be expected within Peru; its calyx lobes are deltoid, 4 mm. wide, only 2 mm. long, flowers 2.5–3 cm. long, and *C. silvicola* A. C. Sm. Contr. U. S. Nat. Herb. 29: 363. 1950, of Ecuador, similar but glabrous, calyx tube terete. Among other known Ecuadorian species are *C. alatum* (Hoerold) Sleumer, the calyces winged, the leaves 2.5–3.5 (4.5) cm. long and serrate; *C. charianthum* A. C. Sm. l.c. 360, unique in its corolla with cylindric tube, spreading lobes. The remaining species have entire glabrous larger leaves, cuneate at base: *C. loranthiflorum* Benth. has continuous pedicels, the flowers 1.5–2 cm. long; *C. calycinum* (A. C. Sm.) Sleumer and *C. Albertsmithii* Sleumer have flowers 3.5–4 cm. long, the former with puberulent inflorescence, calyx lobes 6 (8) mm. long, the latter glabrous, the calyx lobes twice as long, and the related *C. macranthum* A. C. Sm. l.c. 361, the calyx 5-winged, instead of cylindric or 10-costate, the corolla at least 4.5 cm. long at anthesis. F.M. Negs. 28922; 38236.

Peru(?): Near Oyacachi, *Jos. Jussieu,* type. Ecuador. "Chupalon" (Jussieu).

7. PELLEGRINIA Sleumer

Like *Ceratostema* but filaments conspicuously pilose-tomentose with short retrorse trichomes and pedicels always, instead of exceptionally, continuous.—So limited by Smith, Bull. Torr. Bot. Club 63: 309. 1936 (followed by Sleumer in 1941), and correctly, if the probable origins of the species groups are by preference indicated generically rather than sectionally. The name honors meritoriously as section or genus the affable and eminent Fr. Pellegrin of the Natural History Museum Herbarium, Paris.

Corolla 4–5 cm. long.
  Leaves usually shorter than 4 cm......*P. coccinea, P. grandiflora.*
  Leaves usually 4 cm. long or some longer............*P. hirsuta.*
Corolla scarcely 2 cm. long.......................*P. Harmsiana.*

Pellegrinia coccinea (Hoerold) Sleumer, Notizbl. Bot. Gart. Berlin 12: 288. 1935. *Ceratostema coccineum* Hoerold, Bot. Jahrb. 42: 317. 1909; 338.

About 1 meter high with subterete branchlets that at first are pilose like the stout petioles, these 2.5 mm. long; leaves oblong-ovate, rounded at base, obtuse or subacute, heavy coriaceous, glabrous or sparsely puberulent on both sides, 3–4 cm. long, 1–1.5 cm. wide; flowers single or 2–3-fasciculate on stoutish pedicels sometimes 2 cm. long; calyx tube pilose, 4–7 mm. long, 3–4 mm. across at base, the lobes lanceolate, acute, 7–10 mm. long; corolla glabrous or slightly pilose, finally 4–5 cm. long, 8 mm. thick, the lobes 3–5 mm. long; filaments densely appressed pubescent; anther sacs nearly smooth, produced at base, 8–11 mm. long; tubules about 3.5 cm. long, flaring at the open tips, the pore sometimes lacerated.—Flowers scarlet (Weberbauer). F.M. Neg. 4644.

Huánuco: Tambo de Vaca, *4376*. Cani, *3544*. Near Huánuco, *2163*.—Junín: Near Palca, 3,400 meters, *Weberbauer 2505*, type.

Pellegrinia grandiflora (R. & P.) Sleumer, Notizbl. Bot. Gart. Berlin 12: 288. 1935. *Ceratostema grandiflorum* R. & P. Fl. Peruv. 4: *pl. 383*. 1802; 338. *C. longiflorum* Lindl. Fl. Serres sér. 1. 4: 346b. *pl. 353*. 1848. *C. Urbanianum* Hoerold, Bot. Jahrb. 42: 319. 1909.

Low shrub, more or less puberulent-pilose even to the flowers, but becoming glabrous; petioles 1–2 mm. long; leaves ovate-oblong, subcordate or rounded at base, obtuse or acutish, 1.5–3 cm. long, 7–12 mm. wide, rigid-coriaceous; flowers 1–3 on slender pedicels 5–15 mm. long, their basal bractlets oblong, about 2 mm. long; calyx tube 2–3 mm. long, twice as broad, the limb with the abruptly acuminate lobes 5–7 mm. long; corolla rather thin, 2–4 cm. long, nearly 1.5 cm. wide at base, the 5 or 6 lobes 1.5 mm. long; filaments about 3 mm. long, pilose; anther sacs to 6 mm. long, obtuse at base; tubules 12–25 mm. long, the terminal pores sometimes slightly oblique.—Leaves of type callous-margined, apparently more persistently pilose above than beneath; calyx, corolla and pedicels, especially the last, loosely pilose-villous. The native name refers to the shape of the corollas (Ruíz & Pavón). F.M. Neg. 7033.

Huánuco: Muña, (*Pearce*). Mito, *3361*.—Junín: Huasahuasi, *Dombey; Ruíz & Pavón*, type. Prov. Jauja, *Weberbauer 6644*. Huacapistana, *Weberbauer 2201* (type, *C. Urbanianum*). "Uchu-uchu" or "huchu-huchu" (i.e., aji-aji, Ruíz & Pavón).

Pellegrinia Harmsiana (Hoerold) Sleumer, Notizbl. Bot. Gart. Berlin 12: 288. 1935. *Ceratostema Harmsianum* Hoerold, Bot. Jahrb. 42: 317. 1909; 340.

Glabrous or essentially except for the solitary or binate flowers; branchlets enlarged at base of petioles, these 2–3 mm. long; leaves ovate-oblong, rounded or broadly cuneate at base, obtuse or subacute at apex, 12–17 mm. long, half as wide, rigid-coriaceous, entire or shallowly crenate, obscurely 3–5-plinerved; pedicels 6–8 mm. long, the basal imbricate bractlets about 2 mm. long; calyx tube 3–3.5 mm. long, the lobes about as long; corolla 16–19 mm. long, the deltoid lobes 5 mm. long; filaments 3 mm. long, pilose, the smooth anther sacs 8 mm. long, exceeded by the slender tubules, these apically dehiscent by pores.—F.M. Neg. 4646.

Huánuco: Monzón, 3,300 meters, *Weberbauer 3374*, type.

Pellegrinia hirsuta (R. & P.) Sleumer, Notizbl. Bot. Gart. Berlin 12: 288. 1935. *Ceratostema hirsuta* R. & P. Fl. Peruv. 4: *pl. 383.* 1802; 339. *C. cordifolium* Dunal in DC. Prodr. 7: 553. 1839. *C. oblongifolium* Dunal, l.c. *C. Lobbii* A. C. Sm. Contr. U. S. Nat. Herb. 28. 337. 1932, fide Smith. *P. Lobbii* (A. C. Sm.) Sleumer, l.c.

Resembles *Ceratostema grandiflorum* but the leaves always subcordate, at least obscurely 5–7-plinerved, 3.5–6 cm. long, 1–2.5 cm. wide, and, especially, the anthers acutely produced at base; calyx lobes acute, soft, to about 9 mm. long; corolla about 2 cm. long (1.5 cm. in type), the lobes 4–6 mm. long; filaments about 2 mm. long, densely retrorse-pilose; anther sacs to 7 mm. long, the tubules twice as long or longer, the slightly oblique oval chinks about 1 mm. long.—The corolla may be longer, the type undeveloped. Illustrated, Smith, l.c. *pl. 2* (as *C. Lobbii*); Bull. Torrey Club 63: 315. *figs. 1–4,* flower and stamen. F.M. Negs. 7034 (*C. cordifolium*); 7035 (*C. oblongifolium*).

Huánuco: Near Muña, *Ruíz & Pavón,* type (*Pearce*). Without data (perhaps not Peru) (*Lobb,* type, *C. Lobbii*).

8. SIPHONANDRA Klotzsch

This one crowds *Ceratostema* and must rest, as section or genus, on the connate or nearly connate filaments; the tubules in the two known species dehisce by flaring but strictly terminal pores and the calyx lobes are as broad or broader than long as rarely in the Jussieu genus, as defined.—There is, however, a certain facies created by the oblong or nearly oblong leaves combined with the exceptional, rather than usual characteristics of *Ceratostema* (calyx-lobes, cylindric calyx and corolla) that distinguish it as a subgeneric or, if personally preferred, generic group.

Siphonandra elliptica (R. & P.) Klotzsch, Linnaea 24: 24. 1851. *Ceratostema ellipticum* (R. & P.) Benth. & Hook. f. Gen. Pl. 2: 570. 1876; 356. *Thibaudia elliptica* R. & P. Fl. Peruv. 4: *pl. 384.* 1802. *C. Weberbaueri* Hoerold, Bot. Jahrb. 42: 316. 1909, fide Smith.

Shrub, more or less pilose even to the pedicels or glabrous, at least in age; petioles to 5 mm. long; leaves oblong or ovate-oblong, cuneate below, obtuse or subacute, 3.5–5.5 cm. long, 1.5–2.5 cm. wide, entire or obscurely crenulate and revolute, pinnate-nerved, the nerves 3–5 on each side, the veins reticulate; rachis 2–5 cm. long, 5–15-flowered with several deciduous ovate bractlets at base about 1.5 mm. long;

pedicels 7–20 mm. long; calyx tube 3.5 mm. long, the limb 4.5 mm. long, including the 2 mm. long lobes; corolla about 2.5 cm. long; filaments glabrous; anther sacs 5 mm. long with erect slender tubules; stigma peltate; fruit cylindrical ovoid, to 12 mm. long, the calyx limb decurrent.—Type of the genus *Siphonandra* Klotzsch with the granular anthers of *Semiramisia* (here part of *Thibaudia,* but the calyx lobes of *Ceratostema* (*Pellegrinia*), the filaments connate, the pores exactly terminal, the calyx articulate). Flowers blood red with white tips (Weberbauer). Illustrated, Hook. Icon. 2: *pl. 108;* Bot. Jahrb. 42: 266 (stamens). F.M. Neg. 29347 (*C. Weberbaueri*).

Cuzco: Cosnipata, *Weberbauer 6929.* Paucartambo, *Raimondi; Soukup 383.* Accanaco, *West 7047* (det. Johnston); *Balls 6704; 6705.* Cerro de Cusilluyoc, *Pennell 13847.* Prov. Urubamba, *Metcalf 30749.* —Apurímac: Río Pinkos, *Weberbauer 5861.*—Puno: Sandía, *Weberbauer 740* (type, *C. Weberbaueri*); *Soukup 223.* San Gován, *Lechler 2276.* Locality not known to me, *Ruiz & Pavón,* type. Bolivia.

Siphonandra pilosa A. C. Sm. Contr. U. S. Nat. Herb. 28: 355. 1932. *Ceratostema pilosum* (A. C. Sm.) Macbr. Univ. Wyo. Publ. 11: 42. 1944.

Scarcely differs from *S. elliptica* except in the denser, more permanent pubescence, especially of the pedicels and calyces, the last with subequal tube and limb, the lobes 1.5 mm. long; anther sacs 4 mm. long; tubules about 18 mm. long.—Probably will prove to be a variety but no intermediates known. F.M. Neg. 26655.

Puno: Tabina, *Lechler 2053.* Bolivia.

9. PERICLESIA A. C. Sm.

Here we have a *Ceratostema*-like shrub "immediately recognized by its four large calyx lobes, its connate filaments and its slender tubules with oblique pores" (Smith). Considering all known species, the four calyx lobes were the unique feature while this was combined with the filaments of *Siphonandra* and the slender habit of *Semiramisia.* Like the latter, a convenient segregate, if desired, and named, as so many genera, after one of the better known personalities of ancient history, in this case one with a musical name, too, which should help to perpetuate it. Needless to say, the number of calyx lobes is a variable character in some species groups, sometimes an individual one, and, since Smith proposed the genus, has proved to be so here so that now species are known with 5-lobed calyces, the lobes large, much longer than wide, or small and about as broad as long, leaving this particular series of species resting on a "combination of calyx, anther and habital characters" (Smith). *Plutarchia angulata* A. C. Sm. (Journ. Arnold Arb. 24: 466. 1943) if sought here may be known by its 4-merous flowers, winged calyx tube, densely pubescent angled corollas; it has been collected in Putumayo in Colombia.

Smith, Mem. N. Y. Bot. Gard. 8: 57. 1952, has expressed the opinion that *Periclesia* is not generically distinct from *Ceratostema;* in arriving at this conclusion he has of course opened the way to a review of the relative importance of characters as indicators of generic values.

Periclesia flexuosa A. C. Sm. Contr. U. S. Nat. Herb. 28: 357. 1932. *Ceratostema flexuosum* (A. C. Sm.) Macbr. Univ. Wyo. Publ. 11: 42. 1944.

Branchlets slender, subterete, at first puberulent as the subrugose petioles, these 2 mm. long; leaves lanceolate-oblong, 4–6 cm. long, 12–18 mm. wide, attenuate at base, obtusely acuminate, margins entire but narrowly revolute, obscurely 3–5-plinerved, glabrous; flowers 4-merous, subterminal, solitary or geminate, densely pilose as also the articulate pedicels, these about 1.5 cm. long; calyx tube broadly obconic, 3–4 mm. long, the flaring lobes 2–2.5 cm. long, 10–12 mm. wide at base, lanceolate-deltoid, acute, membranous, reticulate-veined; corolla narrowly cylindric, submembranous, about 5 cm. long, tapering to the lanceolate long-acuminate lobes, these to 2 cm. long; filaments membranous but firmly connate, sparsely pilose; anther sacs granular, to 6 mm. long, the very slender membranous tubules about 3.5 cm. long with oblique pores 0.5 mm. in diameter. —There are two related Ecuadorian species, *C. lanceolatum* Benth. and *P. Reginaldii* Sleumer, Bot. Jahrb. 71: 400. 1941. The latter, rather less characteristic of the segregate genus *Periclesia*, has, according to the author, larger flowers, longer anthers. The Lobb plant may have been from Ecuador or Colombia. Illustrated, Smith, l.c. *pl. 7.*

Peru(?): Without data (*Lobb,* type). Colombia?

10. SEMIRAMISIA Klotszch

Resembles *Ceratostema* except that the calyx lobes are inconspicuous or only about as broad as long and the corollas and tubules are extraordinarily developed (typically), the former cylindric-campanulate, broad, that is, in proportion to length, and the latter, even though sometimes rigid, up to four times as long as the anther sacs; also the filaments usually are half connate. Dehiscence by "short introrse clefts" or terminal oblique pore.—Actually, as intimated by Smith, l.c. 329, this seems to be an exaggerated type of *Ceratostema* but a more convenient segregate than some others by nature of the flower-shape and the rather slender instead of often rather stocky habit of *Ceratostema* as delimited. However, if *S. fragilis* A. C. Sm. Bull. Torrey Club 60: 112. 1933, of Ecuador, with cylindric urceolate corollas, nearly 2.5 cm. long and only 4–5 mm. broad at the larger base, is included these species contribute merely another—and weak —link in the series of generic names.

Flowers usually 2 together, the pedicels to 3 cm. long. *S. Weberbaueri.*
Flowers several, racemose; pedicels to 1.5 cm. long. . .*S. pulcherrima.*

Semiramisia pulcherrima A. C. Sm. Journ. Arnold Arb. 24: 461. 1943.

Shrub with slender terete branchlets, glabrous except the distinct pilose filaments; leaves ovate, rounded or broadly obtuse at base, gradually acuminate, 4.5–6 cm. long, 2.5–3 cm. wide, 3-plinerved, the veins distinct only beneath; racemes in the uppermost axils, 5–8-flowered, the pedicels 8–15 mm. long with a few ovate basal bracts 1.5 mm. long; calyx 1–1.5 cm. long, the apiculate lobes less than 1 mm. long, biglandular; corolla orange-red, fleshy, 4–5 cm. long before anthesis, seemingly to 2 cm. broad at apex, the lobes 6–10 mm. long and wide; filaments free, pilose-puberulent especially at base; anther sacs about 8 mm. long, tubules very slender, 2.5–3 cm. long, the dehiscence by terminal or slightly oblique pore.—Type from along the upper Río Putumayo, but in Colombia and of course to be expected in Ecuador and Peru; important, as emphasizing the natural affinity with *Ceratostema.*

Peru (probably): Adjacent Colombia; Ecuador?

Semiramisia Weberbaueri Hoerold, Bot. Jahrb. 42: 310. 1909; 349. *Ceratostema Andreanum* Drake, Journ. de Bot. 3: 75. 1889?

Low or scandent glabrous shrub with slender terete branchlets; petioles 4–5 mm. long; leaves ovate-oblong, 6–8 cm. long, 2–3.5 (4) cm. wide, rounded to a truncate base, caudate-acuminate, entire or somewhat crenulate, 3–5-nerved, the veins distinctly reticulate; flowers 2 on inarticulate pedicels as long as 3 cm.; calyx tube obconic, 8–9 mm. long, about 8 mm. across at the top, the lobes less than 1 mm. long; corolla broadly campanulate-cylindric, about 4 cm. long, 1.5–2 cm. wide, thin, orange-red, closely veined, the lobes 4 mm. long or longer, twice as wide; filaments glabrous, membranous, connate; anther sacs about 6 mm. long, granular, incurved at base with membranous but rigid tubules 2 cm. long or longer, dehiscing by short clefts; stigma truncate.—Not seen but ex char. *C. Andreanum* seems possibly to be this species or the scarcely distinct *S. speciosa* (Benth.) Kl., 349, of Ecuador, the leaves rounded at base. Both seem to be nearly *S. speciosa* (Benth.) Kl. of Ecuador, leaves ovate, truncate to subcordate at base; calyx tube narrowly winged or angled. Illustrated, Bot. Jahrb. 42: 266 (anthers). F.M. Neg. 4735 (*S. Weberbaueri*).

Cajamarca: Huancabamba, (*Poortmann 222*, type, *C. Andreanum*).—Amazonas: Chachapoyas, 2,200 meters, *Weberbauer 4455*, type.—San Martín: Cerro de Escalero, *Ule 52* in part.—Junín: Pichis Trail, *Killip & Smith 25850*.—Puno: Santo Domingo Trail, Prov. Carabaya, *Metcalf 30657* (det. Smith). Ecuador.

11. DEMOSTHENESIA A. C. Sm.

Thibaudia-like species but the pedicel always continuous with the calyx, and, especially, this with elongate lobes that suggest those of *Ceratostema*. Furthermore, the usually slightly unequal stamens have tubules much longer than the anther cells, filaments sparsely pilose with spreading trichomes.—Aristate stipules are often present, as in *Pellegrinia* (and *Eleutherostemon*) but the stamens are the more primitive ones of *Thibaudia* (Smith).

Leaves at most about 2 cm. long; corolla (known) to about 1 cm. long.
  Leaves 8–15 mm. long.
    Pedicels 1–2 cm. long . . . . *D. amicorum, D. buxifolia.*
    Pedicels 3–5 (12) mm. long . . . . *D. Weberbaueri.*
  Leaves, at least some, longer than 1.5 cm. . . . . *D. Pearcei.*
Leaves usually longer than 2 cm.; corolla 2–5 cm. long.
  Corollas rarely 5 mm. in diameter . . . . *D. Mandoni.*
  Corollas to 1 cm. in diameter . . . . *D. spectabilis.*

Demosthenesia amicorum Sleumer, Bot. Jahrb. 71: 404. 1941. *Vaccinium amicorum* Sleumer, Notizbl. Bot. Gart. Berlin 13: 136. 1936.

Branchlets finely pubescent; stipules glandular; leaves closely crowded, subsessile, elliptic, rounded at base, rounded or obtuse at tip, 11–16 mm. long, 5–7 mm. wide, entire, obscurely margined, drying grayish-green, coriaceous, glabrous except for some minute deciduous pubescence and with 2 basal nerves rather inconspicuous above, obscurely elevated beneath; flowers axillary, solitary or rarely geminate on somewhat rigid glabrous pedicels, these to 12 mm. long; calyx in fruit glabrous, obscurely 5-costate, the 5 short lobes broadly deltoid, inflexed; fruit 5-celled.—Corolla unknown and the plant might therefore be even *Thibaudia*, sens. lat., while the habit is that of *D. microphylla* (Hoer.) A. C. Sm.; but it could equally well be a *Sphyrospermum* or a *Vaccinium;* however, the leaves suggest those of the much named *D. buxifolia* (Field. & Gardner) A. C. Sm. The name refers to the collectors, notable alike in botanical annals and in friendship.

Junín: Ccarrapa, wooded hillsides, 2,500 meters, *Killip & Smith 22298*, type.

Demosthenesia buxifolia (Field. & Gardner) A. C. Sm. Bull. Torrey Club 63: 310. 1936. *Ceratostema buxifolium* Field. & Gardner, Sert. Pl. 1: *pl. 7.* 1844; 340. *Themistoclesia buxifolia* (Field. & Gardner) Klotzsch, Linnaea 24: 42. 1851. *Pellegrinia buxifolia* (Field. & Gardner) Sleumer, Notizbl. Bot. Gart. Berlin 12: 288. 1935. *Thibaudia microphylla* Lindl. Gard. Chron. 23. 1848.

A compact little shrub, glabrous or essentially even to the flowers, these usually solitary on slender flexuose pedicels a cm. or two long; petioles 1–2 mm. long; leaves elliptic, rounded or acute at base, 8–15 mm. long, 5–8 mm. wide, entire, rigid-coriaceous, obscurely plinerved; calyx tube broadly obconical, about 1 mm. long, the ovate lobes 1.5 mm. long or about twice as long as the limb; corolla 10–11 mm. long, the lobes 1 mm. long; stamens equal, the filaments 2 mm. long, pilose with spreading or ascending trichomes; anther sacs a little granular, about 3.5 mm. long, the flexible tubules 5.5 mm. long, opening by clefts nearly as long; stigma truncate or subpeltate.

Junín: Huacapistana, 3,000 meters, *Weberbauer 2075*.—Dept. unknown: Monte de San José, (*Mathews 1176*, type). Without data (*Lobb; Maclean*).

Demosthenesia Mandoni (Britton) A. C. Sm. Bull. Torrey Club 63: 311. 1936. *Ceratostema Mandoni* Britton, Bull. Torrey Club 20: 137. 1893; 342. *Pellegrinia Mandoni* (Britton) Sleumer, Notizbl.

Bot. Gart. Berlin 12: 288. 1935. *C. Pilgerianum* Hoerold and *C. sanguineum* Hoerold, Bot. Jahrb. 42: 318. 1909, fide Smith. *C. Graebnerianum* Hoerold, l.c. 315. *C. microphyllum* Hoerold, l.c. 316. *P. Graebneriana* (Hoerold) Sleumer, l.c. *D. Graebneriana* (Hoerold) A. C. Sm. l.c. 310.

More or less pilose shrub, the branchlets and leaves usually glabrous in age or sometimes earlier, the flowers glabrous to densely pilose; petioles about 2 mm. long; leaves broadly ovate to oblong-ovate, rounded to subcuneate at base, obtuse or acute, mostly 1.5–2 cm. long (8–28 mm.), 6–13 mm. wide, entire or obscurely crenate at the often thickened margins, coriaceous, obscurely pinnate or slightly plinerved; flowers solitary or 2–3-fasciculate, the pedicels 5–15 mm. long with few to many basal bractlets 2–3 mm. long; calyx tube obconic, 2–3 mm. long, the limb 5–7 mm. long with the lobes, these to 5 mm. long; corolla 2–3 cm. long, 4–8 mm. thick, stamens slightly unequal, the pilose filaments about 3 and 4 mm. long; anther sacs more or less granular, sometimes nearly smooth, 4–6 mm. long; tubules 13–20 mm. long, the clefts more or less elongate.—Flowers dark pink to blood red (Weberbauer). Smith's suggestion that only one variable species is concerned is followed here. Illustrated, Bull. Torrey Club 63: 315. *figs. 5–7* (flower and stamens). F.M. Negs. 4645 (*C. Graebnerianum*); 4649 (*C. Pilgerianum*).

Cuzco: Yanamanche, *Weberbauer 4979* (type, *C. microphyllum*). Paucartambo, *Raimondi*. Cosnipata, *Weberbauer 6928*. Marcapata, *Weberbauer 7790*. Lucumayo Valley, *Cook & Gilbert*. Cerro de Cusilluyoc, *Pennell 14096*. Near Pillahuata, *West 7076* (det. Johnston, *C. Graebnerianum*). Accanaco, *Vargas 325; 9643; Balls 6705*. Valle de Santa Ana, *Bües 2114*.—Puno: Sandía, *Weberbauer 742* (type, *C. Graebnerianum*); *742a* (type, *C. Pilgerianum*). Near Sandía, *Weberbauer 889* (type, *C. sanguineum*).

Demosthenesia Pearcei (Britton) A. C. Sm. Bull. Torrey Club 63: 310. 1936. *Rusbya Pearcei* Britton, Bull. Torrey Club 20: 68. 1893. *Ceratostema Pearcei* (Britton) A. C. Sm. l.c. 60: 111. 1933. *Pellegrinia Pearcei* (Britton) Sleumer, Notizbl. Bot. Gart. Berlin 12: 289. 1935.

Glabrescent densely leafy epiphytic shrub; stipules lanceolate, 3–5 mm. long, deciduous; leaves ovate-oblong, obtuse at the narrowed tip, early minutely nigrescent-pilose beneath, mostly 15–22 mm. long, 5–9 mm. wide; flowers solitary or binate on continuous pedicels 6–12 mm. long, minutely several-bracted at base; calyx tube

5-angled or narrowly alate, 2–3 mm. long, the ovate-deltoid acute lobes 1–1.5 mm. long; corolla red, 6–8 mm. long, nearly equaled by the subequal stamens, their filaments pulverulent-pilose; tubules 4–4.5 mm. long, clefts elongate.—After Smith, l.c. 112. Nearly *D. Weberbaueri;* Bolivian but to be expected in adjacent Peru.

Peru (possibly). Bolivia.

Demosthenesia spectabilis (Rusby) A. C. Sm. Bull. Torrey Club 63: 311. 1936. *Ceratostema spectabile* Rusby, Bull. N. Y. Bot. Gard. 4: 404. 1907; 343. *Pellegrinia spectabilis* (Rusby) Sleumer, Notizbl. Bot. Gart. Berlin 12: 288. 1935.

Allied to *D. Mandoni* but the leaves 2–3 cm. long, 6–12 mm.wide, glabrous in age; pedicels 6–10 mm. long, the several basal bractlets to 7 mm. long, densely spreading puberulent; calyx tube 5 mm. long, the limb about 6 mm. long including the lobes, these 5 mm. long; corolla densely pilose puberulent, 7–10 mm. thick, 3.5–5 cm. long, the lobes 3 mm. long; anther sacs about 5 mm. long, the tubules 26 and 27 mm. long, the clefts of indefinite length; stigma truncate.—Illustrated, Smith, Contr. U. S. Nat. Herb. 28: *pl. 3*.

Cuzco: Lucumayo, (*Pearce*). Near Pillahuata, 2,800 meters, *West 7078* (det. Johnston). Escalerayoc, *Vargas 11107* (det. Standley, *C. grandiflorum*). Bolivia.

Demosthenesia Weberbaueri Sleumer, Repert. Sp. Nov. 41: 119. 1936. *Pellegrinia Weberbaueri* Sleumer, Notizbl. Bot. Gart. Berlin 13: 214. 1936.

Resembles *D. buxifolia* but the leaves 8–12 mm. long, 2.4–5 mm. wide, pedicels only 3–5 mm. long, the calyx with deltoid acute lobes 3 mm. long, the lobes 1–1.3 mm. long, the corolla only 7–8 mm. long, well-exceeding the stamens, these subequal with densely pilose filaments, subgranular anther cells, the tubules 3.5 mm. long with clefts about half as long.—Corolla ventricose at base, rose-tinted; fruit subcylindric, 5-angled, 5 mm. long, crowned by the inflexed calyx lobes. It is nearly *D. Pearcei.*

Ayacucho: Above Osno, 3,400 meters, *Weberbauer 5564*, type.

12. ANTHOPTERUS Hook.

Similar to *Thibaudia* in greater or less degree but the calyx tube winged to the sinuses, the corolla to the lobes.—Definite as the single character is, and apparently never relatively developed, the genus is better marked than several of the other offshoots of the closely allied group. However, compare also *Themistoclesia,* a small-leaved, small-flowered ally.

Anthopterus racemosus Hook. Icon. Pl. 3: *pl. 243.* 1840; 407. *Thibaudia racemosa* (Hook.) Hoerold, Bot. Jahrb. 42: 274. 1909.

Glabrous shrub or small tree with straight subterete branchlets, short stout angled petioles, oblong-lanceolate leaves, these entire, 3-nerved, gradually acuminate, truncate at base, 1–1.5 dm. long, 3–4 cm. wide; raceme-rachis to 1.5 dm. long, the continuous pedicels to 2 cm. long; calyx urceolate, about 8 mm. long, 5-winged to sinuses, the wings semiovate, the erect lobes ovate-deltoid, acute, 1.5–2 mm. long; corolla submembranous, conical-urceolate, nearly 1.5 cm. long; filaments connate below into a membranous tube; anthers smooth, the tubules about twice as long as the sacs and opening by narrow elongate but relatively short clefts; stigma truncate.

Amazonas: Moyobamba, *Mathews,* type.

13. PLUTARCHIA A. C. Smith

A part of *Demosthenesia* and/or *Thibaudia* but the pedicels always articulate. Calyx limb equaling or several times longer than the rarely alate tube, in Peru 4-lobed nearly to base. Corolla subcylindrical or angulate, the stamens nearly as long, filaments equal or slightly unequal, the lightly or minutely granular anthers with tubules mostly 2–4 times longer, dehiscing by elongate clefts.—The author remarked that his genus also shows certain features suggestive of *Cavendishia* and perhaps indicates a close relationship between that genus and *Thibaudia.* The original species comprised compact shrubs with small obscurely veined leaves, aristate stipules (or none?) and the inflorescence of 1–3 flowers often with a few small basal bracts. It simulates, at least, *Agapetes* D. Don of Asia, as Sleumer indicated by his key, Bot. Jahrb. 71: 389. 1941. The recent discovery of *P. angulata* emphasizes the continuity of the known characters within the tribe.

Plutarchia angulata A. C. Sm. Journ. Arnold Arb. 24: 466. 1943.

Branchlet tip early cinereous pilose as the petioles (1–3 mm. long) and the upper axillary 2–5-flowered racemes including the younger calyces, these at anthesis with 4 conspicuous wings (2–3 mm. broad) opposite the sinuses, the erect limb 8–9 mm. long, lobed nearly to the base, the subcoriaceous elongate-deltoid gradually acute segments probably accrescent; leaves broadly ovate, to 3.5 cm. long, 4 cm. wide, slightly costate, obtuse or subrounded apically, 7–9 plinerved, soon glabrous above, early hispidulous-pilose beneath, especially on the elevated nerves, the veins obscure or little obvious; inflorescence bracts few, ovate, 2–3 mm. long, papyraceous as the floral, these oblong, acuminate, 3–4 mm. long, the articulate pedicels 8–20 mm. long; corollas tubular, 4-angled, to (type) 21 mm. long, 5–6 mm. in diameter, densely villous-velutinous, within glabrous as the 8 similar, little shorter stamens, the free ligulate filaments 2–3 mm. long, anther cells minutely granular, 4–7 mm. long, tubules flexible, mostly about twice as long, dehiscent by elongate clefts.—Although *P. angulata* does not bear a close superficial resemblance to the other species its staminal characters indicate that it can belong to no other genus (Smith).

Peru (probably). Adjacent Colombia.

14. **MACLEANIA** Hook.

Psammisia Kl. Linnaea 24: 42. 1851.

Shrubs, various in habit and size of vegetative parts but definable by a combination of *Ceratostema* and *Thibaudia* characters, particularly as regards the first by the granular anther cells, the tubules normally rigid (rarely membranous), and, as regards the latter, by the dehiscence, this usually by elongate or elongate-ovate sometimes fused clefts, or if by pore, this about two-thirds as long as tubule. Filaments distinct or connate as often the tubules, the connectives alternately, rarely all, sometimes none, more or less spurred. Calyx articulate with pedicel, cylindrical, angled or winged.—Scarcely distinct from *Thibaudia* sens. lat. but often with rather more definition than many of the groups and useful as pointing up the basic trends toward both *Ceratostema* and *Thibaudia*. As for *Psammisia*, Smith argued, l.c. 325–326, that the diagnostic characters are relatively developed so that "whether . . . five genera or two or one are recognized is purely a matter of personal conception" and again (Journ. Arnold Arb. 27: 96. 1946) "although the presence of anther-spurs has long been used as the most obvious character separating *Psammisia* from *Macleania* there are also supplementary characters of habit and foliage which seem to distinguish these two groups"; and, further, l.c., "as to the advisability of reducing *Psammisia* and *Macleania* to *Thibaudia*, this seems to the writer quite unjustified, since at any rate the three groups would presumably be maintained as strong subgenera or sections, thus accomplishing nothing but further confusion of the generally accepted nomenclature." As for the first premise, even with only the dozen Peruvian shrubs concerned before one there is no less homogeneity than in several of the other larger genera and certainly they are all, as Smith suggests, more closely allied than to any species of any other group of species. As to the second possibility, there would, it seems, be one generic name and one not too weak section (same strength as *Macleania* including *Psammisia*), the species pretty nicely marked even within Peru. Since definitive boundaries for *Macleania,* if retained, are questioned, the species names are here left in *Psammisia, Macleania* and *Thibaudia,* as available.

The genus (or section of *Thibaudia*) honors John Maclean, Lima merchant who did great service to botany by his own individual exertions and by his patronage of the late Mr. Mathews (Hooker, 1837). Besides the following, *P. ferruginea* A. C. Sm., l.c. 391, of southern Colombia has been collected recently in Putumayo and if found in Peru may be known easily by the ferrugineous-tomentose indument, the rather small leaves abruptly caudate-acuminate.

KEY TO MACLEANIA (including *Psammisia*)

Calyx tube narrowly winged; filaments connate; anthers produced into a single tubule.
  Corolla finally 3–4 cm. long, the leaves farinose or glabrate beneath. *M. macrantha.*
  Corolla about 2 cm. long.
    Plants somewhat puberulent-pilose, the pedicels less than 1 cm. long .... *M. floribunda.*
    Plants glabrous or glabrate, the pedicels 2 cm. long. *M. angulata.*
Calyx tube not wing-angled; anthers produced into 2 tubules, these distinct or connate; filaments free unless toward base.
  Leaves plinerved, sometimes shortly; connectives usually more or less spurred; tubules distinct.
    Leaves oblong-elliptic, abruptly short-caudate; anthers with tubules about 6 mm. long .... *Ps. pauciflora.*
    Leaves ovate-oblong or oblong-lanceolate, sometimes narrowly or shortly but more or less gradually acuminate.
      Leaves to 7-plinerved, often 3–4 dm. long; connective spurs obscure .... *Ps. Ulbrichiana.*

Leaves to 5-plinerved, often shorter than 2.5 dm.; connective spurs (sometimes solitary) obvious.

Calyx lobes 2–5 mm., tubules 3–4 mm. long.
Ps. guianensis, Ps. coarctata.

Calyx lobes 6–8 mm., tubules 2–3 mm. long. . . . *Ps. fissilis.*

Leaves pinnate-nerved; connectives not spurred or obscurely in *Ps. globosa;* tubules more or less connate.

Corolla subglobose, 4 mm. long; tubules nearly free. . *Ps. globosa.*

Corolla cylindric-urceolate, to 1.5 cm. long; tubules at least one-half free.

Plants more or less farinose. . . . . *M. farinosa.*

Plants glabrous or glabrate, not farinose.

Basal pedicel bracts several to many. . . . *M. Benthamiana.*

Basal pedicel bracts sometimes 2. . . . . *M. rupestris.*

Macleania angulata Hook. Bot. Mag. 69: *pl. 3979.* 1843; 365.

Glabrous, the branchlets terete; leaves ovate, rounded or narrowed at the base, obtuse, 5–8 cm. long, 3–4 cm. wide, 5-plinerved; flowers axillary-fasciculate, usually 3 together on pedicels 2–2.5 cm. long; calyx tube narrowly winged; corolla 5-angled, 2 cm. long or longer; stamens 10, the filaments united; tubules opening by wide introrse clefts about half as long; stigma capitate.—Type a cultivated (1842) specimen probably Andean in origin and quite possibly from Peru. *M. costeroides* Sleumer, Bot. Jahrb. 71: 401. 1941, Ecuadorian, has 7-nerved chartaceous leaves and globose corollas only 7 mm. long.

Peru(?): (*Maclean*, type).

Macleania Benthamiana Walp. Repert. Bot. 6: 415. 1847; 374. *M. multibracteata* Mansf. Notizbl. Bot. Gart. Berlin 9: 436. 1925, fide Smith.

Subscandent glabrous shrub marked in flower by the several imbricate oblong-lanceolate bractlets, some of them 5–8 mm. long, that subtend basally the subfasciculate inflorescence of 8–20 flowers; branchlets stout; petioles rugose, winged above, to 2 cm. long; leaves oblong or ovate-oblong, attenuate at base, obtuse or subacute, subentire and revolute at margins, often 1–2 dm. long, 3–5 cm. wide, dark punctate above, pinnate-nerved; pedicels 6–10 mm. long; calyx tube obconical; corolla cylindric-urceolate, 12–15 mm. long, 4–5 mm. thick, contracted at throat, the lobes about 2 mm. long; stamens 10, the dark-colored filaments free, marginally pilose, anther sacs and tubules each about 4 mm. long, the latter connate, their oval clefts about half as long; stigma truncate.—In Ecuador, as other species, known as "joyapa."

Huánuco: Chaglla, *3664; Weberbauer 6704* (type, *M. multibracteata*). Ecuador.

Psammisia coarctata (R. & P.) A. C. Sm. Contr. U.S. Nat. Herb. 28: 401. 1932. *Thibaudia coarctata* R. & P. Fl. Peruv. 4: *pl. 385.* 1802. *T. bicolor* R. & P. ex Dunal in DC. Prodr. 7: 561. 1839. *P. bicolor* (R. & P.) Klotzsch, Linnaea 24: 44. 1851. *P. Engleriana* Hoerold, Bot. Jahrb. 42: 304. 1909. *P. Urbaniana* Hoerold, l.c. 307. *P. Weberbaueri* Hoerold, l.c.

Lax or subscandent shrub, glabrous except the flowers, these early somewhat brown pilose medially without; branchlets stout, subterete; petioles 6–10 mm. long; leaves oblong or ovate-oblong, 1–2.5 dm. long, 3–7 cm. wide, often a third smaller, acutish to more or less cuneate at base, subentire or shallowly crenate toward the usually well-acuminate tip, shortly 5–7-plinerved, closely reticulate-veined; raceme-rachis conspicuously scarred by fallen pedicels, the attached ones 2–4.5 cm. long and each subtended by an oblong bractlet 3–4 mm. long; calyx 7 mm. long, the teeth broad, acute, the tube broadly campanulate, 2–4 mm. long; corolla cylindric urceolate, often 2–2.5 cm. long, 8 mm. thick near base; filaments distinct, pilose, the connectives alternately and acutely 2-spurred or sometimes spur developed only on one margin; anther sacs 6–8 mm. long, the tubules half as long.—Liana with rose-red flowers (Mexia); scarlet below, white or pale yellow above the narrowed portion (Weberbauer). Sleumer accepts publication as by Don under *Thibaudia,* Gen. Syst. 3: 860. 1834. *M. columbiensis* Hoerold (Smith, l.c. 398) has been found as near as Putumayo and may be distinguished by the connate filaments, the inflorescence glabrous. Illustrated (anthers), Bot. Jahrb. 42: 266. F.M. Negs. 7028; 4704 (*P. Urbaniana*); 4705 (*P. Weberbaueri*); 4487 (*P. Engleriana*).

Cajamarca: Near Socota, 3,200 meters, *Stork & Horton 10130.*—Huánuco: Pillao, Acomayo, Chinchao, Muña, *Ruiz & Pavón,* type. Cayumba, 1,020 meters, *Mexia 8223a.* Pampayacu, *Sawada P36.* Near Monzón, *Weberbauer 3510* (type, *P. Engleriana*).—Junín: Huacapistana, *Weberbauer 2151* (type, *P. Weberbaueri*); *Killip & Smith 24138; Raimondi.* Hacienda Schunke, *5626.*—Puno: Sandía, *Weberbauer 1159* (type, *P. Urbaniana*).

Macleania farinosa Mansf. Notizbl. Bot. Gart. Berlin 9: 436. 1925; 383.

Well marked by the yellowish-farinose 3–6-flowered inflorescences; branchlets glabrous in age; petioles rugose to 7 mm. long; leaves ovate or obovate, attenuate at base, rounded or obtuse at apex, entire, glabrous or nearly above, early laxly pilose beneath, pinnate-nerved, 5.5–9 cm. long, 3–6 cm. wide; pedicels 3–6 mm. long, the articulation obscure; calyx tube 3 mm. long and broad, the deltoid lobes about 2 mm. long; corolla cylindric, 13–14 mm. long, about 3 mm. thick, the lobes 2–3 mm. long; stamens 10, 8.5–9 mm. long, the dark glabrous filaments distinct, the anther sacs 4 mm. long, the connate tubules nearly as long, opening by elongate oval clefts more than half their length; stigma truncate.—An isolated species so distinct that it cannot be placed with accuracy (Smith).

Cajamarca: East of Huancabamba, 2,400 meters, *Weberbauer 6120*, type.

Psammisia fissilis A. C. Sm. Contr. U. S. Nat. Herb. 29: 372. 1950.

Resembles *P. coarctata* but the much larger spreading calyx limb deeply split into 3 (4) lobes, these 6–8 mm. long and wide; tubules 2–3 mm. long.—The Peruvian collection agrees excellently with type except that collector noted it as a tall shrubby tree and the inflorescence is compact, the rachis less than 1 cm. long, with 4–6 flowers, inconsequential differences in view of the similarity of foliage and flowers (author).

San Martín: Almirante, Rioja, *Sandeman*. Ecuador.

Macleania floribunda Hook. Icon. Pl. 2: *pl. 109*. 1837; 363.

A low shrub, the glabrous bark of the terete branchlets deciduous; petioles rugose, 3–5 mm. long; leaves ovate, more or less narrowed at base, acute or acuminate, 4–6 cm. long, 2–3 cm. wide or smaller, entire and narrowly revolute at margins, glabrous or nearly, 5-plinerved, the veins obscure; flowers solitary or in small fascicles on rugose pedicels 6–7 mm. long with several oblong bractlets at base 2–4 mm. long; calyx tube minutely brown pilose, narrowly winged (wings about 0.8 mm. wide), the lobes about 1 mm. long; corolla subcylindric, lightly pilose without, soon glabrous, laxly pilose within, 2–2.5 cm. long, about 5 mm. in diameter, the lobes 2.5 mm. long; stamens 9.5–10 mm. long, the filaments firmly connate, the granular anther sacs 4–4.5 mm. long, the single tubule submembranous, 2–2.5 mm. long with cleft nearly as long; stigma truncate.

Amazonas: Jambrasbamba, (*Mathews 1442*, type).

Psammisia guianensis Klotzsch, Linnaea 24: 43. 1851; 399. *P. Ulei* Hoerold, Verhandl. Bot. Ver. Brandenb. 50: 92. 1907, fide Smith.

Essentially glabrous or the younger parts minutely puberulent; petioles 5–12 mm. long; leaves oblong-lanceolate, 10–22 cm. long, 3–7 cm. wide, typically rounded or truncate at base (acutish to acute in Peru; rounded-acute in *P. Ulei*), caudately acuminate, 5-plinerved, the midnerve impressed above, the veins reticulate; axillary short racemes of 8–20 blossoms with rachis 7–20 mm. long; pedicels 1.5–2.5 cm. long, the basal bract 1.5 mm. long; calyx tube campanulate, 2–4 mm. long, 3 mm. thick, the limb, including the 3, 4, or 5 ovate apiculate lobes 2–5 mm. long; corolla 18–27 mm. long, 5 mm. thick near the base, contracted to the long throat, the lobes oblong, 2–4 mm. long; stamens 9–12.5 mm. long; filaments free unless at base, 3–5 mm. long, pilose and with long connectives, at least the alternate 2-spurred; anther sacs 5–6 mm. long, the tubules about half as long; fruit subspherical, to 12 mm. thick, tipped by the broad coriaceous calyx limb.—Probably should be included in *T. coarctata*, at least as to Peru, if variation in size of leaves and flower parts occurs. F.M. Negs. 4691; 4702 (*P. Ulei*).

Cajamarca: Cutervo, *Raimondi* (det. Smith with query).—San Martín: Tarapoto, *Spruce 4357*. San Roque, *Williams 7343; 7712*. Cerro de Escalero, *Ule 6340* (type, *P. Ulei*).—Huánuco: Cueva Grande, *4792*.—Loreto: Mouth of Río Santiago, *Tessmann 3954*. Bolivia to Colombia and British Guiana.

Psammisia globosa A. C. Sm. Contr. U. S. Nat. Herb. 28: 388. 1932.

Glabrous subscandent shrub, the terete branches becoming several meters long; petioles rugose, stout, 1–2 cm. long, narrowly winged above; leaves broadly lanceolate-oblong-elliptic, acuminate, narrowed to base, 2–3.5 dm. long, 3.5–9 cm. wide, coriaceous, pinnate-nerved, the veins reticulate; racemes 6–8-flowered, pedicels 8–15 mm. long, the subtending bract about 2 mm. long; calyx tube broadly campanulate, 3 mm. long, 5 mm. broad; corolla subglobose, 3–4 mm. long, 4 mm. thick, the acute lobes about 1 mm. long; stamens 10, the broad filaments densely pilose marginally, the alternate connectives obscurely 2-spurred; anther sacs stout, about 1.8 mm. long, the shorter slender tubules nearly completely cleft; stigma truncate; fruit subglobose, fleshy, deep pink, to 1 cm. in diameter.—Illustrated, Smith, l.c. *pl. 9.*

Junín: Hacienda Schunke, *5754; Killip & Smith 24868.* Without locality, *Mathews 2077*, type.

Macleania macrantha Benth. Pl. Hartw. 223. 1846; 363.

Resembles *M. floribunda* and *M. angulata* but the cylindric corolla 3–4 cm. long, 4–5 mm. in diameter, contracted to long throat 3 mm. broad, the spreading lobes about 2.5 mm. long; petioles winged above, 1–3 mm. long; leaves 5–7-plinerved (the nerves prominent beneath, the veins reticulate), ovate, cuneate at base, more or less obtusely short-acuminate, at least early sparsely pubescent beneath with stiff brown trichomes, these appressed on the rugose obscurely articulate pedicels (7–12 mm. long) and flower buds; calyx obpyramidal, 6–7 mm. long, 3 mm. wide at tip, the wings about 0.5 mm. broad, the fruit apiculately lobed (lobes only 1 mm. long, 3 mm. wide); stamens 11–12 mm. long, the anther sacs 5–5.5 mm. long, the single tubule rigid, about 3 mm. long with introrse distal pore about 2 mm. long.—The Klug specimen has the obsolete or minute calyx lobes of the species but is nearly glabrous as *M. longiflora* Lindl. of Ecuador. The nerves are prominent but the veins are obscure.

Loreto: Pumayacu, *Klug 3211* (det. Smith). To Colombia.

Psammisia pauciflora Griseb. ex A. C. Sm. Contr. U. S. Nat. Herb. 28: 394. 1932.

Glabrous or essentially glabrous shrub, the branchlets terete; petioles 6–10 mm. long, slightly rugose, narrowly winged above; leaves oblong, cuneate at base, caudate-acuminate, 1.5–2.5 dm. long, 5–7 cm. wide, thick-coriaceous, 5-plinerved, the veins densely reticulate; raceme-rachis rarely 1 cm. long, 6–10-flowered, the pedicels 10–15 mm. long, their basal bractlets 2 mm. long; calyx tube 2.5–3 mm. long, 4 mm. across; corollas 19–27 mm. long, 4–5 mm. thick at base, the lobes to 3 mm. long; stamens 10, the free filaments pilose, the 2 connective spurs acute and about twice as broad as the connective; anther sacs to 3 mm. long, the tubules connate at base, 2–3 mm. long; stigma truncate.—Nearly *M. elliptica* Rusby, 395, of Bolivia with leaves 16–18 cm. long, 8–9 cm. wide. This was referred by Hoerold to *T. leucostema*, i.e. *P. guyanensis*, and that, in turn, is perhaps a variant of *P. coarctata*. F.M. Neg. 38277.

Puno: San Gován, *Lechler 2386*, type. Petalayumi, *Raimondi?* Bolivia; Colombia. "Huilunto" (Raimondi).

Macleania rupestris (HBK.) A. C. Sm. Phytologia 1: 131. 1935. *Thibaudia rupestris* HBK. Nov. Gen. & Sp. 3: 270. 1819, not *T. nitida* HBK. l.c. 271, which is *Cavendishia nitida* (HBK.) A. C. Sm. fide Smith, l.c. *Thibaudia nitida* HBK. Nov. Gen. & Sp. 3: 271. 1819; 376. *Psammisia nitida* (HBK.) Klotzsch, Linnaea 24: 45. 1851, as to name. *Macleania nitida* (HBK.) Hoerold, Bot. Jahrb. 42: 269. 1909, as to name.

Sometimes a small tree, the subterete branchlets as the young leaves beneath, often pilose-puberulent becoming glabrous; petioles rugose, 4–6 mm. long; leaves oblong-lanceolate, acute at base, subacute or obtuse, 4–12 cm. long, 1.5–2 cm. wide or probably larger, entire but slightly revolute-margined, pinnate-nerved, the veins reticulate; racemes borne near the tips of the branchlets, 4–15-flowered; pedicels in type 14–16 mm. long, the subtending bractlet 3 mm. long; calyx glabrous or nearly, the tube about 3 mm. long; corolla about 2 cm. (12–22 mm.) long, about 6 mm. thick at the base, the lobes 1.5–2 mm. long; stamens 10, the free filaments subglabrous, the anther sacs 4.5–7 mm. long, the connate tubules 4–6 mm. long, cleft half way; stigma peltate.—Fruit edible. To this or possibly to *M. Benthamiana* or *Ps. Ulbrichiana* (Smith, 405) apparently goes *Psammisia longicolla* Hook. f. Bot. Mag. 91: *pl. 5526.* 1865, which was sent to the author by Bateman from an unstated locality, probably from eastern Colombia or Ecuador; ex char. there seems to be no distinction at least from *T. nitida* unless in the apparently (from plate) somewhat larger (3 cm.) flowers that are scarlet below the green tips, the calyx bibracteolate at base. It seems better separated from *M. Benthamiana* with more bracts and from *Ps. Ulbrichiana* with leaf-nerves in part not basal. F.M. Neg. 4695.

Piura: Palamba, *Weberbauer 6041.*—Cajamarca: Cutervo, *Raimondi.* Huambos, *Weberbauer 4182.* Near Socota, *Stork & Horton 10142* (det. Standley, *M. Benthamiana*). To Colombia and Venezuela.

Psammisia Ulbrichiana Hoerold, Bot. Jahrb. 42: 306. 1909; 405.

Subscandent shrub, glabrous unless for a slight puberulence on the younger terete branchlets; petioles stout, rugose, 10–18 mm. long, winged above; leaves oblong or lanceolate-oblong, 2–4 dm. long, 6–10 cm. wide, cuneate below, long-acuminate above, subentire, usually

7-plinerved, the nerves prominent beneath where sometimes reddish, the veins reticulate; racemes 10–30-flowered, the stout rachis 1–2 cm. long; pedicels 2–4.5 cm. long, the basal bractlet 3 mm. long; calyx tube campanulate, 2.5–4 mm. long, 4–6 mm. broad, the 5 lobes 2 mm. long; corollas 18–25 mm. long, 5–6 mm. thick at base, often jointed above the middle, the lobes 2–3 mm. long; filaments free or nearly, sparsely pilose, the alternate connectives usually 2-spurred, the spurs rounded, obscure; anther sacs 4–6.5 mm. long, the tubules connate the lower half, 2.5–5 mm. long, stigma peltate.—Inflorescence coral red or corolla scarlet, the lobes white. The Putumayan *P. Cuatrecasasii* A. C. Sm. Journ. Arnold Arb. 24: 464. 1943 has wider leaves (12–14 cm. wide) and bracts, and longer anther spurs, these nearly or quite 1 mm. long; it will probably be found in Peru. Smith has suggested, l.c. 406, that *P. longicolla* Hook. f. Bot. Mag. 91. *pl. 5526.* 1865, collected by Bateman from "South America," may "quite possibly" be the same, but it has small bractlets at summit of pedicel.

Amazonas: Chachapoyas to Moyobamba, *Williams 7597.*—Huánuco: Cushi, *4851.*—Junín: Pichis Trail, *Killip & Smith 25946.*—Cuzco: Cerro de Cusilluyoc, *Pennell 14028.* Above Tambo Mayo, *Goodspeed 7153.* Ecuador.

15. **THIBAUDIA** R. & P.

Character in general that of *Ceratostema* and affiliates, but possibly distinct by the salient character of the more or less lateral, more or less elongate dehiscence of the relatively short but flexible tubules, these ordinarily little, if at all, exceeding the smooth or slightly granular anther sacs. Thus typically defined, the calyx in the majority of species is articulate with the pedicel and always not at all winged. —Thibaud was a professor of botany in Strasburg, about 1800.

Lateropora A. C. Sm., 333, a shrub or tree of Panama, has the anthers completely dehiscing by lateral cleft, the tubules rudimentary, in these important respects resembling *Wittsteinia* F. von Muell. but the flowers are racemose, the ovary 5-celled, while the Australian plant is a prostrate or creeping shrub with solitary flowers, the ovary 2–3-celled. *Mycerinus* A. C. Sm., 359, of Amazonian Venezuela (*M. scleophyllus* A. C. Sm.), is an isolated monotype marked by a 5-winged calyx, the wings not to the sinuses but to the lobe tips, the anther connectives divided into 2 appendages as long as the short tubules. Less well marked, the calyx angled with the lobes, is *Polyclita* A. C. Sm., Bull. Torrey Club 63: 314. 1936, based on *Chupalon turbinatum* Kuntze of Bolivia, which, in my opinion, may be a convenient segregate; however, it was retained in *Thibaudia* by Hoerold and indeed by Smith himself in 1932, l.c. 415.

Inflorescence glabrous, rarely farinose, unless the flowers, or lightly pilosulous in *T. Engleriana* (key division of expediency, species probably fewer); filaments sometimes free or nearly.

Calyx strongly apophysate, the corolla conical..... *T. apophysata.*

Calyx cylindric-campanulate or rarely subspherical; corolla cylindric or somewhat urceolate.

Leaves acute or acutish at the sometimes rounded, sometimes cuneate base.

Leaves at least mostly broadest about or below the middle.

Flowers solitary, or, if two, together.

Leaves rarely 2 cm. long.................... *T. biflora.*

Leaves 2.5–4 cm. long..................... *T. uniflora.*

Flowers several to many.

Leaves obviously acuminate, clearly plinerved; filaments distinct or lightly coherent.......... *T. floribunda.*

Leaves rounded to acute apically, sometimes more or less plinerved; pedicels articulate, sometimes obscurely.

Anther connective not spurred; leaves often shorter than 7 cm.

Corollas 7–12 mm. long; leaves rather ovate or obovate.

Leaves more or less plinerved, the reticulate veins prominent.

Corollas glabrous within apically.. *T. crenulata.*

Corollas pubescent within apically.. *T. diphylla.*

Leaves subpinnate-nerved, faintly reticulate. *T. Harmsiana.*

Corollas 13–16 mm. long; leaves about oblong, 1–2.5 cm. wide..................... *T. angustifolia.*

Corollas about 16–20 mm. long; leaves ovate. *T. Urbaniana.*

Anther connectives spurred alternately; leaves 7–10 cm. long........................ *T. cupatensis.*

Leaves broadest above the middle, thus more or less clearly spatulate or obovate, glabrous; species doubtful.

Corollas glabrous within.................. *T. ovalifolia.*

Corollas pilose or tomentose within.
  Corollas glabrous without . . . . *T. spathulata.*
  Corollas slightly pilose without . . . . *T. obovata.*
Leaves subcordate to truncate at base, crenulate to subentire. *T. Engleriana.*

Inflorescence even after flowering more or less pilose; filaments (unknown, *T. cardiophylla*) connate or loosely connate (*T. tomentosa*).
  Leaves deeply cordate . . . . *T. cardiophylla.*
  Leaves not at all cordate.
    Leaves sublinear, sulcate-revolute . . . . *T. tomentosa.*
    Leaves plane or nearly.
      Leaves somewhat obovate . . . . *T. obovata.*
      Leaves somewhat narrowed at both ends.
        Leaves oblong or lanceolate-oblong-elliptic, little widened medially, to about 4 times longer than wide.
          Anthers and tubules 4 mm. long; leaves rather pinnate-nerved . . . . *T. Moricandi.*
          Anthers and tubules (type) about 2.5 mm. long; leaves rather plinerved . . . . *T. Herrerae.*
        Leaves more or less ovate-elliptic or -lanceolate, clearly widened medially, often only 2–3 times longer than wide.
          Leaves sparsely pilose to glabrous . . . . *T. melliflora.*
          Leaves softly pilose beneath.
            Leaves attenuate to base . . . . *T. regularis.*
            Leaves rounded at base . . . . *T. Rauhii.*

Thibaudia angustifolia Hook. Icon. Pl. 2: *pl. 110.* 1837; 431. *Eurygania angustifolia* (Hook.) Klotzsch, Linnaea 24: 26. 1851. *T. Weberbaueri* Hoerold, Bot. Jahrb. 42: 313. 1909, fide Smith.

Low shrub essentially glabrous, including the flowers, the branchlets and petioles, more or less rugose, the latter 2–3 mm. long; leaves rather narrowly oblong, 3.5–5.5 cm. long, 1–2.5 cm. wide, a little narrowed at base, subacute, or obtusish, minutely serrate, pinnate-nerved, the nerves often obscure; rachis of racemes rarely 1 cm. long, 3–8-flowered; pedicels 5–10 mm. long with basal bracts about 2 mm. long; calyx tube rugose, 2.5 mm. long, 3 mm. broad; corolla 13–16 mm. long, about 4 mm. thick, the lobes 1.5 mm. long; filaments dark, 2.5 mm. long, firmly connate, densely pilose, the connectives slender, the anther sacs smooth, 4.5 mm. long with wide tubules about as long, the clefts elongate; stigma truncate.—Flowers dark rose to blood red (Weberbauer). F.M. Neg. 4638 (*T. Weberbaueri*).

Cajamarca: Chota, *Raimondi*.—Amazonas: Bagasan near Chachapoyas, (*Mathews 1443*, type). Molinopampa, *Weberbauer 4339* (type, *T. Weberbaueri*).

Thibaudia apophysata Hoerold, Bot. Jahrb. 42: 314. 1909; 421.

A glabrous shrub about 2 meters high with slender subterete castaneous branchlets and rugose narrowly winged petioles 1–3 mm. long; leaves oblong, attenuate at base, acute, 6–7 cm. long, 1.5–2.5 cm. wide, thick-coriaceous, slightly revolute and shallowly crenate, pinnate-nerved, the veins obscure; racemes short, 6–10-flowered, the rigid flowers on violaceous pedicels about 2 cm. long or longer that are subtended by a minute deciduous bract, the articulation with the calyx obscure; calyx tube strongly ventricose, 1.5 mm. long, 5–6 mm. thick, the limb with the broadly deltoid lobes about 1 mm. long; corolla short-cylindric, 7–9 mm. long, about half as thick; filaments coherent at base, sparsely pilose with well-developed connectives; anther sacs slightly granular, 3 mm. long with flexible tubules about 2.5 mm. long, opening by large oval clefts; stigma truncate.—In aspect suggestive of some species of *Macleania* (*Psammisia*) as *P. Lehmannii* (Smith). Flowers scarlet with white tips. F.M. Neg. 4623.

Junín: Huacapistana, 2,800 meters, *Weberbauer 2071*, type.

Thibaudia biflora (Poepp. & Endl.) Hoerold, Bot. Jahrb. 42: 274. 1909; 435. *Ceratostema biflorum* Poepp. & Endl. Nov. Gen. & Sp. 1: 6. *pl. 10*. 1835. *Eurygania biflora* (Poepp. & Endl.) Benth. & Hook. Gen. Pl. 2: 568. 1876.

Slender shrub 2–3 meters high, the subterete branchlets early densely puberulent but becoming glabrous; petioles 1–2 mm. long; leaves ovate, 1.5–2 cm. long, 10–13 mm. wide, rounded at both ends, entire, essentially glabrous, obscurely 5-plinerved, the nerves sometimes slightly raised on both sides; inflorescence axillary, 1–3-flowered; pedicels terete, 4–6 mm. long, spreading pilose, the basal imbricate oblong bractlets about 2 mm. long; calyx tube 3 mm. long; corolla 11–15 mm. long, 2.5 mm. thick, sparsely pilose, the lobes 1–2 mm. long, densely pilose within; stamens 7–8 mm. long, the connate filaments glabrous; anther sacs smooth, 2–3 mm. long, the tubules 4 mm. long; dehiscence long-lateral; fruit subspherical to

5 mm. thick.—The plant from Junín was growing in a sphagnum swamp; the others are said to have been epiphytic.

San Martín: Near Tarapoto, *Spruce 4430.* Cerro de Escalero, *Ule 6790.*—Huánuco: Cerro de San Cristobal near Cuchero, *Poeppig 1350,* type.—Junín: Pichis Trail, *Killip & Smith 25686.*

Thibaudia cardiophylla Sleumer, Notizbl. Bot. Gart. Berlin 12: 135. 1934.

Shrub to 1 meter high, the stout older branches minutely puberulent, the younger white pubescent; petioles thick, 2 mm. long; leaves ovate, deeply cordate at base, broadly acuminate, the tip itself obtuse or rarely acutish, 3.5–5 cm. long, 2–3 cm. wide, coriaceous, above shortly white pubescent or hirsutulous, beneath reddish brown with some appressed trichomes and, especially on midnerve, white pilose, subentire or minutely callous denticulate; fascicles or racemes axillary, 2–3-flowered, the fruiting pedicels more or less white pilose, to 2 cm. long, articulate with the calyx, this obconic, densely pubescent, about 8 mm. long including the triangular lobes; corolla not known. —Probably, the author suggests, nearest *T. Engleriana.*

Huánuco: Southwest of Monzón, 3,200 meters, (*Weberbauer 3588,* type).

Thibaudia crenulata Remy, Ann. Sci. Nat. sér. 3. 8: 234. 1847.
T. boliviensis (Kuntze) Hoerold, Bot. Jahrb. 42: 275. 1909; 437.
Hornemannia boliviensis Kuntze, Rev. Gen. Pl. 3, pt. 2: 191. 1898.
T. neo-Herrerae Sleumer, Notizbl. Bot. Gart. Berlin 12: 136. 1934?

Similar to *T. melliflora* but glabrous, the leaves sometimes rather smaller or larger and somewhat plinerved and the corollas somewhat smaller; pedicels 8–20 mm. long, the basal bractlet 2 mm. long; calyx tube 1.5 mm. long, the limb 1–2 mm. long; corolla 7–11 mm. long; stamens 5.5–6 mm. long, the anther sacs 2–2.5 mm. long, the tubules 1.5–2 mm. long.—Doubtfully more than a geographic variant and from description there seems to be no important difference between Sleumer's species based on an Herrera specimen in Herb. Dahlem without data except "Prov. Cuzco," and that of Kuntze. The leaves and flowers are said to resemble those of *T. regularis* but are completely glabrous. Synonymy after Smith, Contr. Nat. Herb. 29: 378. 1950. F.M. Negs. 4624; 38272.

Cuzco: Valle de Santa Ana, Hacienda Huadquina, 1,500 meters, *Herrera 3317; 3279* (fide Herrera). Achirani, *Vargas 11111* (distr.

as *Vaccinium*). Summit of Huana Picchu, 1,800 meters, *West 6437* (det. Johnston, *T. regularis*). Bolivia. "Monte-capuli."

Thibaudia cupatensis Huber, Bol. Mus. Goeldi 7: 304. 1913.

Glabrous, scandent, the long straight or slightly flexuose gray-barked branches 2–4 mm. thick; petioles 7 or 8 mm. long, 2 mm. thick, articulate at base, biglandular below the apex; leaves ovate, rounded at base, shortly acuminate, 5–10 cm. long, 3–6 cm. wide, some much smaller, rigid-coriaceous, at base shortly 7-plinerved, opaque, laxly reticulate, remotely subdentate; flowers 2–6-fasciculate; pedicels to 8 mm. long, minutely bracted at base and bracteolate below the middle; calyx cyathiform, 2 mm. broad and high, articulate; corolla little inflated, 11 mm. long, the tube 3–4 mm. broad, lobes to 2 mm. long, erect, subobtuse; filaments free or nearly, 4 mm. long, anthers dorsifixed, uncinate at base, lower part 2.5 mm. long, tubes 6 mm. long, flexible, longitudinally dehiscent, disk annular, style as long as corolla, stigmas capitate; fruit black, 4 mm. long and thick, the many cuneate-ovoid seeds scrobiculate.—Intermediate in characters to *Satyria* and *Ceratostema* (Huber).

Peru (probably). Amazonian Brazil.

Thibaudia diphylla Dunal in DC. Prodr. 7: 562. 1839. *T. leucostoma* (Lindl.) Sleumer, Notizbl. Bot. Gart. Berlin 12: 291. 1935. *Vaccinium leucostomum* Lindl. Gard. Chron. 7. 1848. *T. ovata* (Hook. f.) Hoerold, Bot. Jahrb. 42: 275. 1909; 433. *Eurygania ovata* Hook. f. Bot. Mag. 104: *pl. 6393*. 1878. *T. Graebneriana* Hoerold, l.c. 313, fide Smith.

Low shrub, glabrous except the corollas within and the subterete branchlets, these merely puberulent at tips; petioles 2–4 mm. long, narrowly winged above; leaves ovate, cuneate at base, subacute or obtuse, typically 2–5 cm. long, about 1–2 cm. wide, coriaceous, glossy, 5-plinerved or nearly pinnate-nerved, the nerves prominent beneath, the veins reticulate; racemes short, 3–8-flowered; pedicels not articulate, striate, 8–13 mm. long (or to 2.5 cm.), the basal bracts lanceolate, fimbriolate, 3 mm. long; calyx tube subcylindric or campanulate, 2.5 mm. long, 3 mm. broad, the thin limb 2–3 mm. long; corolla cylindric, 8–9 (12) mm. long, 4 mm. thick, densely pubescent within at apex; stamens 6 mm. long, the connate (at least below) filaments glabrous or sparsely pilose; anther sacs smooth, 2.5 mm. long, with a few trichomes at base; tubule clefts flaring, 2 mm. long; stigma peltate.—Synonymy after Smith, Contr. U. S. Nat. Herb. 29:

376. 1950. *T. ovata* ex char. has somewhat longer petioles and corollas as indicated in parentheses, the former with tiny ciliate warts, and the filaments said to be connate only below. Flowers coppery red with white tips (Weberbauer). Illustrated, Fl. des Serres 4: *pl. 332.* F.M. Negs. 38273; 4629 (*T. Graebneriana*).

Junín: East of Palca, (*Weberbauer 2436*, type, *T. Graebneriana*); *Raimondi.* Carpapata, (*Killip & Smith 24353*).—Dept. doubtful: "Veto," possibly Viso above Matucana, 2,500 meters, (*Lobb 276*, type, *T. ovata*).

Thibaudia Engleriana Hoerold, Bot. Jahrb. 42: 312. 1909; 416.

Glabrous except the lightly pubescent short racemes; branchlets rigid, stout, early sharply angled; petioles rugose, 4–6 mm. long; leaves rigid-coriaceous, prominently pinnate-nerved beneath, oblong, subcordate or truncate at base, obtuse, more or less revolute and crenate, 5–7 cm. long, 2–3 cm. wide; pedicels to 2 cm. long, the basal oblong coriaceous bract about 3 mm. long; calyx tube 4 mm. long, the rigid limb 6 mm. including the acute lobes; corolla rigidly fleshy, 18 mm. long, 5 mm. thick; stamens nearly exserted, the loosely coherent filaments glabrous, 3 mm. long; anther sacs somewhat granular, 6 mm. long, the tubules 8 mm. long, the clefts nearly as long; stigma truncate.—Shrub about 2 meters high with flesh-colored flowers, the throat of the corolla white. F.M. Neg. 4626.

Junín: Huacapistana, 3,000 meters, *Weberbauer 2055*, type.

Thibaudia floribunda HBK. Nov. Gen. & Sp. 3: 269. *pl. 254.* 1819; 413. *T. pichinchensis* Benth. Pl. Hartw. 223. 1846, fide Smith.

Essentially glabrous shrub or small tree, the elongate subterete branches early brownish and sparsely puberulent, becoming glabrous and ashy; petioles rugose, stout, winged above, 5–10 mm. long; leaves typically oblong-lanceolate or broadly oblong or ovate-oblong, 8–22 cm. long, 2.5–6 cm. wide, shortly cuneate at base, acuminate, subcoriaceous, 5 (3–7) -plinerved, the veins reticulate beneath; racemes 15–30-flowered, axillary or often on leafless branchlets, the striate rachis 2–6 cm. long; pedicels 5–10 mm. long (the oblong basal bract 2–4 mm. long), continuous with calyx, the campanulate tube of this 2–3 mm. long and broad, the limb 1–2 mm. long with minute acute lobes; corolla 12–16 mm. long, 3–4 mm. thick, the lobes 1–1.5 mm. long; stamens 8.5–15 mm. long, the pale slightly pilose filaments 2–4 mm. long; anther sacs smooth, 2.5–4 mm. long, the wide tubules 5–8 mm. long with elongate clefts; stigma peltate.—The Ecuadorian form has ovate-oblong, rather abruptly acuminate leaves and is shortly pilose in the inflorescence, the type from Colombia being glabrous; it, therefore, is at least a variety, var. **pichinchensis** (Benth.) Macbr., comb. nov. *T. amplectens* Sleumer, Notizbl. Bot. Gart. Berlin 12: 58. 1934, of Ecuador has deeply cordate-amplexicaul leaves. F.M. Negs. 4627; 4632 (*T. pichinchensis*).

Huánuco: Below Huánuco, *Sawada P43*. Playapampa, *4874*. To Colombia.

Thibaudia Harmsiana Hoerold, Bot. Jahrb. 42: 314. 1909.

Nearly glabrous, branching, scandent, the branches and branchlets terete, the bark brown, smooth; petioles stout, 3 cm. long; leaves ovate, rounded at base, very shortly acuminate, 4–7 cm. long, 2.5–4 cm. wide, mostly 5-nerved, fleshy coriaceous, serrate or subserrate, the pinnate nerves little impressed above, prominent beneath; flowers many in axillary and terminal racemes; rachis to 2.5 cm. long; pedicels nearly 12 mm. long with 2 small acute bracts at base, articulate with calyx, this globose-campanulate, 2.5 mm. long, limb minutely 5-denticulate; corolla cylindric-tubular, subinflated, fleshy coriaceous, somewhat contracted at throat, 7 mm. long and broad, to 1.5 mm. broad, shortly 5-dentate, slightly puberulent within; stamens 10, included, the filaments 2 mm. long; lower part of anthers 1.5 mm. long, the little broader tubules 1.5 mm. long, dehiscing by chinks; stigma capitellate.—After author; flowers cinnamon-red with white throat.

Huánuco: Near Monzón, 2,000 to 2,500 meters, *Weberbauer 3542*, type.

Thibaudia Herrerae A. C. Sm. Contr. U. S. Nat. Herb. 28: 435. 1932.

Branchlets puberulent; petioles 2–3 mm. long, winged above, rugose; leaves lanceolate-ovate, narrowed at base, obtuse or subacute, entire, 3.5–5 cm. long, 10–12 mm. wide, coriaceous, glabrous, 5-plinerved, the nerves raised beneath; racemes 5–8-flowered, the striate rachis spreading pilose as the rugose pedicels, these 12–16 mm. long with a basal ovate ciliate bractlet 2 mm. long; calyx 2 mm. long, the limb including the apiculate lobes 1.5 mm. long; corolla fleshy, essentially glabrous, 9 mm. long, 3 mm. thick at middle; stamens about 7 mm. long, the connate filaments glabrous; anther sacs slightly granular, setose at base, 2.2 mm. long, the wide tubules somewhat longer; stigma truncate.—Leaves narrow, inflorescence delicate

(Smith). The setose anthers are an interesting characteristic here, also in *T. melliflora*.

Cuzco: Forontoy, Santa Ana Valley, *Herrera 1384*, type.

Thibaudia melliflora R. & P. Fl. Peruv. 4: *pl. 387*. 1802; 437. *Eurygania multiflora* Klotzsch, Linnaea 24: 27. 1851. *T. mellifera* [R. & P.] St. Hil. Expos. Fam. Nat. 363. 1805.

Sparsely branched shrub about 1 meter high, the branches exfoliate, the younger branchlets and petioles puberulent, the latter stout, winged, 2–3 mm. long; leaves ovate or slightly obovate, attenuate at base, obtuse or subacute, 4–7 cm. long, 2–3 cm. wide, entire, fleshy coriaceous, pinnate-nerved, the lateral nerves prominent beneath, glabrous or puberulent at base above and sparsely pilose on nerves beneath; racemes 7–15-flowered, the densely spreading pilose pedicels 6–15 mm. long; calyx tube rugose, subglabrous, 2.5 mm. long, 3.5 mm. across; corolla scarlet, glabrous, 9–15 mm. long, 3–4 mm. thick; stamens 8 mm. long, the filaments glabrous, connate, the anther sacs slightly granular and at base a little setulose, 3–4 mm. long, the tubules scarcely 3 mm. long; stigma truncate.—Fruit edible; Sleumer prefers the publication by St. Hilaire; as elsewhere, Ruíz and Pavón's vol. 4 has been accepted by me (and others) as publication. The name "sumacmisqui" ("sweet honey") refers to the nectar of the flowers (Ruíz & Pavón). F.M. Neg. 7027.

Huánuco: Churupallana and Pillao, *Ruíz & Pavón*, type. Pillao, *Pearce*. Mito, *1402*. Sariapampa, *Woytkowski 3431*.—Junín: Huacapistana, *Killip & Smith 24244?* (small-leaved). "Puecheto sumacmisqui," "pucsato."

Thibaudia Moricandi Dunal in DC. Prodr. 7: 563. 1839; 430. *T. phyllireaefolia* Dunal, l.c. 564. *Eurygania phyllireaefolia* (Dunal) Benth. & Hook. Gen. Pl. 2: 568. 1876.

Low, more or less pilose shrub or the leaves glabrous, these narrowly oblong, narrowed to base, obtuse, 3–5 cm. long, about 1 cm. wide, crenate-serrate, pinnately nerved; rachis of racemes only 5 mm. long or shorter, with 4–8 flowers on rugose pedicels 5–10 mm. long, the several ovate basal bracts 2–3 mm. long, obscurely articulate with the calyx, this with a campanulate tube 2–2.5 mm. long and broad, the limb as long including the ovate apiculate lobes; corolla thin-carnose, glabrous without, slightly pilose within, about 16 mm. long, 4 mm. thick, the 5 or 6 lobes 2 mm. long; stamens 9–11 mm. long with firmly connate pilose filaments 3–4 mm. long, slender connectives, nearly or quite smooth anthers and tubules both at least 4 mm. long; stigma peltate.—In the type the tubules have oval clefts probably as in the variety **phyllireaefolia** (Dunal) Macbr., comb. nov. (*T. phyllireaefolia* Dunal, l.c.) with corolla densely pilose. F.M. Negs. 28932; 8508 (*T. phyllireaefolia*).

Amazonas: Chachapoyas, *Mathews 3041,* in part, type, and *3041,* type, var.—Huánuco: Acomayo, *Woytkowski 34254.* Pampayacu, *Sawada 35.*

Thibaudia obovata A. C. Sm. Contr. U. S. Nat. Herb. 28: 431. 1932.

Allied to *T. Moricandi* and in general resembling it but the leaves oblong-obovate, 2.5–3.5 cm. long, 12–15 mm. broad, and, especially, the corollas tomentose at the throat as well as laxly pilose without.—With more collections this plant will probably be shown to be an intermediate form as suggested by the author between the species of DeCandolle and *T. angustifolia.* In this case the latter will become the species name. The fact that these plants are all from the same region points strongly to this conclusion. The leaves appear to me to be rather abnormal from injury.

Amazonas: Between Tumbillo and San Carlos, 2,900 meters, *Weberbauer 7154,* type.

Thibaudia ovalifolia [Mathews] A. C. Sm. Contr. U. S. Nat. Herb. 28: 434. 1932.

Shrub with ashy gnarled branchlets, glabrous even to the flowers within; petioles, pedicels and calyces rugose, the first 2–3, the second 12–18, and the last about 5 mm. long; leaves oblong or obovate-oblong, attenuate to base, obtuse or subacute, 5–7 cm. long, 2–3.5 cm. wide, crenate-serrate, pinnate-nerved; racemes 10–20-flowered, the somewhat fleshy corollas 10–11 mm. long, 4 mm. thick; stamens 7 mm. long, the connate filaments 2.5 mm. long; anthers smooth, 5.5 mm. long, slightly longer than the tubules; stigma truncate.—Herbarium name of the collector.

Amazonas(?): Cuesta de Huancabra, (*Mathews 883,* type). Without locality, (*Maclean*).

Thibaudia Rauhii A. C. Sm. Journ. Wash. Acad. Sci. 46: 114. 1956.

Resembles *T. regularis;* branchlets as petioles soon glabrescent, the latter 3–3.5 mm. long; leaves oblong-ovate, narrowly rounded at base, obtuse, 3–4 cm. long, 13–17 mm. wide, early pilose both sides, also sparsely glandular beneath, the nerves inconspicuous; inflorescences subfasciculate, 2–4-flowered, the pedicels 6–9 mm. long; calyx 7 mm. long; corolla at least 1.5 cm. long, 6 mm. thick, copiously pilose without, glabrous within; tubules 2.5–3 mm. long, shorter than cells, the chinks elongate.—Closely related only to *T. regularis* A. C. Sm. and *T. densiflora* (Herzog) A. C. Sm. of Bolivia.

Cuzco: Marcapata, 2,800 meters, (*Rauh & Hirsch 1329*, type).

Thibaudia regularis A. C. Sm. Contr. U. S. Nat. Herb. 28: 436. 1932.

Shrub 1–2 meters high, the petioles, the leaves beneath and the racemes finely and softly pilose; petioles 1–2 mm. long, winged to base; leaves ovate, attenuate to base, acute, 4–5 cm. long, 1.5–2.5 cm. wide, entire or shallowly crenate, glabrous or nearly above, coriaceous, 5-plinerved, racemes 6–8-flowered, the pedicels 10–18 mm. long with ovate-oblong, subtending bractlets 2 mm. long; calyx 3 mm. long and broad, the limb 2.5–3 mm. long; corolla glabrous or pilose within at tip, 11–13 mm. long, 3–4 mm. thick; stamens 7.5 mm. long, the glabrous filaments connate; anther sacs sparsely setose at base, 3 mm. long, the tubules 2 mm. long; stigma peltate.—Perhaps will prove to be a southern variant of *T. melliflora;* cf. also *T. crenulata,* which probably is a glabrous state. Flowers deep coral red (West). Illustrated, Smith, l.c. *pl. 13.*

Cuzco: Valle de San Miguel, Machu-Picchu, 2,200 meters, *Herrera 2004,* type; *Vargas 552* (det. Standley); *West 8020* (det. Johnston). —Puno: Near Limbani, *Metcalf 30544* (det. Smith).

Thibaudia spathulata A. C. Sm. Contr. U. S. Nat. Herb. 28: 434. 1932.

With nearly the floral characters of *T. diphylla* but the fleshy coriaceous leaves obovate, 3.5–5 cm. long, 1.5–2.2 cm. wide; corollas very fleshy and pilose only within, 10–12 mm. long; anther sacs thickly pilose at base, the tubules somewhat longer (3.5–4 mm.), widely opening their entire length.

Ayacucho: Putis, Choimacota Valley, 3,300 meters, *Weberbauer 7530,* type.

Thibaudia tomentosa Hoerold, Bot. Jahrb. 42: 312. 1909; 428.

Shrub with pilose branchlets and leaves (the pilosity deciduous) and densely tomentose (even to corollas) racemes, these near the ends of the branchlets, short, 6–12-flowered; petioles 2–3 mm. long; leaves narrowly oblong, acute or slightly attenuate at base, rounded at apex, strongly revolute, obscurely crenate, 2.5–3.5 cm. long, less than 1 cm. wide, pinnate-nerved, the nerves prominent beneath; pedicels striate, 6–10 mm. long with ovate bractlet less than 1 mm. long; calyx tube campanulate, 1.5 mm. long, 2 mm. thick; corolla subfleshy, to 13 mm. long, 3.5 mm. thick, the lobes 1 mm. long, shortly pilose within; stamens to 9 mm. long, the loosely connate densely pilose filaments 2 mm. long; connectives slender, the anther sacs nearly smooth, pilose at base, the tubules 5 mm. long with clefts about half as long; stigma truncate.—Attains 2 meters; flowers dark rose color. F.M. Neg. 4635.

Amazonas: Molinopampa, near Chachapoyas, *Weberbauer 4374*, type.

Thibaudia uniflora A. C. Sm. Am. Journ. Bot. 27: 543. 1940.

Shrub to 3 meters high, glabrous except for the younger obtusely angled branchlets, these early minutely puberulent; petioles slender, grooved, 2–3 mm. long; leaves ovate, acute or obtuse at base, obtuse or rounded at tip, lightly revolute at the entire margin, 2.5–4 cm. long, 1.5–2.5 cm. wide, coriaceous, the midnerve prominent beneath, the 2 or 3 secondary nerves rather prominent both sides; flowers solitary, axillary, on pedicels 8–15 mm. long that have 3–5 basal oblong-lanceolate imbricate obscurely ciliate bractlets 1–2 mm. long; calyx tube shortly cylindric or obconic, about 3 mm. long and thick, the apiculate lobes 2 mm. long; corolla about 2 cm. long, 3.5 mm. thick, the deltoid lobes 1 mm. long; stamens to 12 mm. long, the connate filaments 2–3 mm. long, the anther cells 4–5 mm. long subequaled by the cleft tubules; style about as long as the coral red corolla.—Nearest, according to the author, to *T. biflora*, which sometimes has single flowers but smaller leaves and subpubescent.

Huánuco: Above Cayumba, 825 meters, in opening on wooded slope, *Mexia 8319*, type.

Thibaudia Urbaniana Hoerold, Bot. Jahrb. 42: 315. 1909; 432.

Glabrous shrub about 2 meters high said to be allied to *T. obovata* and rather similar but the petioles 4–6 mm. long, the leaves ovate, 6–7 cm. long, 3–4 cm. wide, and the short racemes glabrous; corolla 16 mm. long; anther sacs 5.5 mm. long; tubules about 3 mm. long.—Smith remarks that this "bears a very close, superficial resemblance to *T. Harmsiana* but has much larger flowers." Flowers scarlet.

Named for Urban of Dahlem Herbarium, the late great student of West Indian plants. F.M. Neg. 4637.

Amazonas: Between Bagasan and Almirante, *Weberbauer 4449*, type.

16. **CAVENDISHIA** Lindl.

Comparable to *Thibaudia* but the inflorescence usually subtended or enclosed when young by several large often colored bracts and, especially, the filaments alternately unequal, at least the longer usually more than half as long as the corolla, free or connate below. The anthers also are usually unequal. Bracts rarely ample in *Thibaudia*, not in Peruvian species.—Some species of *Orthaea* are not distinguishable except by the terminal (more or less) dehiscence of the tubules, this in *Cavendishia* being similar to that of *Thibaudia* so that species of the former with small bracts simulate those of the latter genus except for the more unequal stamens. *Cavendishia*, therefore, may be a group occupying an intermediate position analogous to that of *Orthaea*. The species as accepted are defined on characters, particularly pubescence, of doubtful merit as more or less indicated in the key, which for expediency is constructed on statements defining only the tendencies apparent in most specimens.

Leaves strongly plinerved or rarely pinnate-nerved but never acutely subcaudate, the principal nerves originating usually more than a cm. above the base; bracts caducous from the more or less distinctly racemose inflorescences.

Flowers clearly and soon openly and finally long-racemose, the bracts more or less promptly caducous.

Stems obviously wing-margined, at least the younger. *C. caulialata.*

Stems terete, obscurely if at all margined...... *C. punctatifolia.*

Flowers in short racemes, congested, the bracts tardily deciduous. *C. Urbaniana, C. Ulei, C. nobilis.*

Leaves (at least mostly) shortly, sometimes scarcely or not plinerved, the principal nerves basal or subbasal, or blades acutely subcaudate.

Flowers in panicles exceeding the leaves.............. *C. Martii.*

Flowers racemose but often congested.

Leaves acutely subcaudate, mostly longer than 1 dm., not rigid, glabrous; racemes soon open............... *C. acuminata.*

Leaves obtusely or acutely but shortly acuminate, mostly shorter than 1 dm., or pubescent, rather rigid-coriaceous; racemes congested in flower.

Flowers, as leaves beneath, these mostly longer than 1 dm., more or less short-pilose.

Indument of leaves beneath nigrescent....... *C. peruviana.*

Indument of leaves beneath cinereous........ *C. pubescens.*

Flowers and (or) leaves usually glabrous or nearly, the leaves always all or mostly considerably shorter than 1 dm. *C. bracteata.*

Besides the following, *C. Cuatrecasasii* A. C. Sm. Rev. Acad. Colomb. Cienc. 5: 38. 1942 has been found recently in adjacent Colombia and if collected within Peru is there distinctive (unless from the imperfectly known *C. nobilis*) by the long calyx limb, this about 1 cm. long including the 3–5 mm. long lobes; this new material has corollas 22 mm. long (instead of 3 cm. for the type), leaves 18 cm. long, half as wide (Smith).

Cavendishia acuminata (Hook.) Hemsl. Biol. Centr. Am. Bot. 2: 272. 1881. *Thibaudia acuminata* Hook. Icon. Pl. 2: *pl. 111.* 1837. *T.? acuminata* Dunal in DC. Prodr. 7: 565. 1839. *C. tarapotana* (Meissn.) Benth. & Hook. f. Gen. Pl. 2: 570. 1876; 476. *Thibaudia tarapotana* Meissn. in Mart. Fl. Bras. 7: 126. 1863. *Chupalon tarapotana* (Meissn.) Kuntze, Rev. Gen. Pl. 2: 384. 1891. *C. Weberbaueri* Hoerold, Bot. Jahrb. 42: 324. 1909?

Glabrous shrub with terete slender branchlets; petioles 7–9 mm. long; leaves oblong-elliptic, cuneate at base, caudate-acuminate (acumen to 1.5 cm. long), 9–13 cm. long, 3.5–6 cm. wide, flexible in the herbarium; inflorescence axillary or terminal, often laxly racemose, 8–12-flowered, more or less deciduously bracted at base; pedicels 8–14 mm. long, the basal papyraceous bract to 1.5 cm. long, 1 cm. wide; calyx tube typically about 2 mm. long, limb with lobes 5 mm. long, the latter 1.5–2 mm. long, or, in form *C. Weberbaueri*, tube 3 mm. long, limb with lobes 2.5 mm. long; corolla to about 18 mm. long; stamens 13 to 15 mm. long, the glabrous or slightly puberulent filaments about 3 and 7 mm. long; anther sacs slightly granulate, 4.5–5 mm. long, the tubules about 6 and 4.5 mm. long; stigma peltate.—The described differences between *C. Weberbaueri* and the type seem in a series of specimens to be intangible, at least as these have been determined; anyway, since there seems to be no substantiating character *C. Weberbaueri* appears scarcely separable at least specifically, and this form, as suggested by Smith, is near *C. strobilifera*, which he considers a synonym. *C. pseudospicata* Sleumer, Bot. Jahrb. 71: 406. 1941, Ecuadorian, has gray pubescent secund and many-flowered racemes, the corollas about 1 cm. long; the leaves to 7 cm. long, less than half as broad. F.M. Negs. 38238; 28918 (*C. tarapotana*); 4683 (*C. Weberbaueri*).

San Martín: Río Mayo near Tarapoto, *Spruce 4302* (type, *T. tarapotana*). East of Moyobamba, *Weberbaueri 4739* (type, *C. Weberbaueri*); *Klug 3249* (det. Smith).—Huánuco: Hacienda Mercedes, Churubamba, 1,200 meters, *Mexia 8200* (det. Smith, *C. Weberbaueri*).—Cuzco: Marcapata Valley, *Weberbauer 7816* (det. Smith, *C. Weberbaueri*). Paucartambo, 3,700 meters, *Vargas 306*. Río Arasa, *Sandeman 3673* (det. Standley, *C. Weberbaueri*). Cerro de Cusilluyoc, *Pennell 14009; 14015* (both det. Smith, *C. Weberbaueri*).—Puno: Near Oconeque, *Metcalf 30565* (det. *C. Weberbaueri*). Without locality, *Jos. de Jussieu* (type, *T. acuminata* Dun.). Ecuador. "Puksato del monte" (Mexia).

Cavendishia bracteata (R. & P.) Hoerold, Bot. Jahrb. 42: 280. 1909; 490. *Thibaudia bracteata* R. & P. Fl. Peruv. 4: *pl. 388*. 1802. *Proclesia bracteata* (R. & P.) Klotzsch, Linnaea 24: 34. 1851. *Chupalon bracteatum* (R. & P.) Kuntze, Rev. Gen. Pl. 2: 383. 1891. *C. pubescens* (HBK.) Hemsl. var. *microphylla* Hoerold, l.c. 332. *C. strobilifera* (HBK.) Hoerold, Bot. Jahrb. 42: 279. 1909; 509. *T. strobilifera* HBK. Nov. Gen. & Sp. 3: 272. 1819, at least as to Peru. *C. Beckmanniana* Hoerold, l.c. 329. *C. Ulbrichiana* Hoerold, l.c. 330, fide Smith.

Shrub-tree typically glabrous including the corollas but in some forms more or less puberulent-pilose, especially the younger parts; petioles rarely more than 5 mm. long, often rugose; leaves ovate-oblong, rounded, subtruncate or slightly cordate at base, obtusely short-acuminate or sometimes acutely (*C. strobilifera*), ordinarily about 4–8 cm. long, 3–4 cm. wide, typically with only 3 subbasal principal nerves and 2 incomplete outer ones but these sometimes well developed, even with an additional pair, thus 5–7- (often more or less) plinerved (*C. strobilifera*), coriaceous, somewhat lustrous; inflorescences early enclosed in their elliptic-ovate bracts 1 or 2 cm. long and more than half as wide, the pedicels, finally 1 cm. or so long, bracteate at base, the bracts and bractlets often somewhat glandular as the calyx lobes, these 1–2 mm. long, the calyx tube about 3 mm. long; corolla infrequently more or less pilose, commonly about 1.5 cm.

long, the nearly as long stamens with free filaments to 4 and 6 mm. long, the anther sacs smooth or nearly, the tubules to about 8 and 10 mm. long, often shorter; stigma peltate.—Fruits edible (Raimondi); the very tasty fruits are sold in the market place of Huánuco (Ruíz & Pavón). Species perhaps divisible as has been suggested but the characters relied upon, at least within Peru, to distinguish them seem intangible or variable. F.M. Negs. 7030; 4654 (*C. Beckmanniana*); 4679 (*C. Ulbrichiana*); 38233 (*C. strobilifera*).

Cajamarca: Prov. Cutervo, *Stork & Horton 10131*. Cutervo, Jaén, *Raimondi*. Huancabamba, (*Pvortmann 21?*, det. Drake, *T. melastomoides*).—Amazonas: Chachapoyas, *Mathews 1444*.—Huánuco: Panao, *2227; Woytkowski 34061a; 114*. María del Valle, *3558*. Pampayacu, *Sawada 2*.—Junín: Pichis Trail, *Killip & Smith 25677*. Oxapampa, *Soukup 2380*. Prov. Tarma, *Woytkowski 35469*. Huassahuassi, *Dombey; Ruíz & Pavón*, type. Palca to Huacapistana, 2,200 meters, *Weberbauer 17770* (type, *C. Ulbrichiana*); *Killip & Smith 23141*.—Huancavelica: Salcabamba, *Stork & Horton 10287*.—Ayacucho: Ccarrapa, *Killip & Smith 22489*; (*22297; 22387*). Aína, *Killip & Smith 23141*.—Cuzco: Near Machu-Picchu, (*Cook & Gilbert 833*). Urubamba Valley, *Herrera 1562*; (*Cook & Gilbert 879*). Above Pillahuata, 2,600 meters, *West 7056; Vargas 79*. Marcapata, *Vargas 9695*. —Puno: Near Puno, *Soukup 416; 458; 514*. Sandía, *Weberbauer 636* (type, *C. Beckmanniana*); *1081a* (type, *C. pubescens* var. *microphylla*). Tabina, *Lechler 1875*. San Gován, *Lechler 2198*. Bolivia; Ecuador?; Colombia? "Yew-ya-may" (Woytkowski), "muñuño," "muyaña," "pucsato."

Cavendishia caulialata (R. & P.) A. C. Sm. Bull. Torrey Club 60: 118. 1933. *Thibaudia caulialata* R. & P. Fl. Peruv. 4: *pl. 386*. 1802. *T. alata* Dunal in DC. Prodr. 7: 562. 1839. *Proclesia alata* (Dunal) Klotzsch, Linnaea 24: 34. 1851. *C. alata* (Dunal) Hoerold, Bot. Jahrb. 42: 279. 1909.

A glabrous shrub (unless for the bracts) becoming several meters high, the long divaricate branches quadrately wing-margined; leaves oblong, cordate at base, acute, minutely and obsoletely denticulate if at all, coriaceous, lustrous above, to about 10 cm. long, half as wide; involucral-like bracts pilose and more or less persisting on the rather short, solitary or paired racemes.—Calyx and corolla apparently as in *C. punctatifolia*, to which it probably goes, the type in flower and undeveloped but Smith, l.c., thought it differs by its "shortened inflorescence and short stout campanulate corollas." F.M. Neg. 38276.

Junín: Huassahuassi, *Dombey*, type.

Cavendishia Martii (Meissn.) A. C. Sm. Bull. Torrey Club 63: 313. 1936. *Thibaudia Martii* Meissn. in Mart. Fl. Bras. 7: 173. 1863. *C. paniculata* Rusby, Mem. Torrey Club 4: 215. 1895; 482. *C. Muschleriana* Hoerold, Bot. Jahrb. 42: 326. 1909.

Sometimes tree-like and 6 meters tall, the branches drooping, the branchlets early sparsely pubescent as the angled petioles, these 5–10 mm. long; leaves broadly ovate-oblong, truncate or obscurely cordate at base, acute or acuminate, 9–20 cm. long, half as wide, heavy coriaceous, somewhat bullate, glabrous above, finely puberulent and also a little granular beneath, in age glabrous, shortly 7-plinerved; inflorescence terminal or axillary, panicled, 50–150-flowered, the primary branch 8–25 cm. long; pedicels 5–12 mm. long, the subtending bract to 1 cm. long; calyx rugose, the glabrous tube 2–2.5 mm. long, the lobes about 1.5 mm. long; corolla to 11 mm. long; filaments distinct, sparsely puberulent, 2 and 2.5 mm. long; tubules 5 and 4 mm. long. —Corolla greenish suffused with red, the tips roseate (Weberbauer). F.M. Negs. 4673 (*C. Muschleriana*); 20044.

Ayacucho: Aína, *Killip & Smith 23199*. Ccarrapa, *Killip & Smith 22432*.—Cuzco: Near Santa Ana, *Weberbauer 5009* (type, *C. Muschleriana*). Cerro de Cusilluyoc, *Pennell 13962*. Machu-Picchu (*Cook & Gilbert 862*); *Vargas 2133*.—Puno: Oconeque, *Metcalf 30566* (det. A. C. Smith). Bolivia; Brazil?

Cavendishia nobilis Lindl. Bot. Reg. 21. sub *pl. 1791*. 1836; 508. *Chupalon nobile* (Lindl.) Kuntze, Rev. Gen. Pl. 2: 384. 1891.

Branchlets stout, glabrous, terete; petioles subrugose, 7–8 mm. long; leaves elliptic-oblong, rounded or broadly cuneate at base, apparently acute, entire, glabrous above, and also beneath or there very sparsely puberulent, strongly 7–9-plinerved, 12–16 (20) cm. long, 5–6 (8) cm. wide; inflorescence axillary with many basal papyraceous ovate-oblong bracts, these to 4 cm. long, 3 cm. wide, spreading pilose.—Otherwise unknown. The description of the flower by Lindley is that of *Psammisia coarctata* which was collected by Mathews under the same number (Smith); the specimen at Vienna had puberulent bracts, slender flowers about 2 cm. long or longer and therefore was presumably the species of Lindley, which probably came from northern Peru. F.M. Neg. 31964 (Herb. Vienna).

Peru: Without locality, (*Mathews 2078,* in part, type, Herb. Kew).

Cavendishia peruviana Hoerold, Bot. Jahrb. 42: 332. 1909; 484.

Branchlets and petioles glabrous, the latter to 6 mm. long; leaves 7–9-plinerved, oblong, truncate at base, obtusely acuminate, 11–14 cm. long, 2.5–5 cm. wide, pilose only beneath, the appressed trichomes blackish; inflorescence finally to 3 cm. long, 10–20-flowered, bracteate at base and when young enclosed by several pilose ovate bracts, these to 2 cm. long, 1.5 cm. wide; pedicels glabrous, about 1 cm. long; calyx tube coriaceous, glabrous or sparsely pilose, about 3.5 mm. long, the lobes 1.5 mm. long, a little glandular; corolla pale pilose becoming glabrate, rose-colored, about 14 mm. long, filaments blackish, free, puberulent, 2.5 and 4 mm. long, the slightly granular anther sacs 3.5 mm. long, the tubules 7 and 5.5 mm. long; stigma truncate.—According to Smith this is distinguished from the similar *C. pubescens* by the different type of pubescence on the lower surface of the leaves, the dark-colored trichomes about 0.2 mm. long, 5–8 per sq. mm.

Puno: Between Sandía and Chunchusmayo, 1,800 meters, (*Weberbauer 1081*, type).

Cavendishia pubescens (HBK.) Hemsl. Biol. Centr. Am. Bot. 2: 273. 1881; 485. *Thibaudia pubescens* HBK. Nov. Gen. & Sp. 3: 273. 1819.

Sometimes 5 meters high and tree-like; branchlets, petioles (6–10 mm. long) and leaves (especially on the nerves beneath) more or less pilose; leaves typically 1–2 dm. long, 4–9 cm. wide, oblong or to broadly ovate, rounded to subcordate at base, acuminate or caudate, 5–7-plinerved; racemes axillary or terminal, 10–25-flowered, when young more or less enclosed in oblong-ovate bracts, these to 2.5 cm. long, 1.5 cm. wide; rachis finally 4–7 cm. long, more or less pilose as the pedicels and calyces, the former 6–10 mm. long, the latter about 6 mm. long, the acute lobes 2–4 mm. long; corolla 2–2.5 cm. long, pilose; stamens 11–18 mm. long, the filaments 3–4 and 5–8 mm. long; anther sacs granular, 5–8 mm. long; tubules 9 and 7 mm., the clefts nearly as long; stigma peltate; fruit to 12 mm. in diameter, persistently pilose.—F.M. Neg. 38230.

Junín: San Ramón, (*Killip & Smith 24882*). Pichis Trail, (*Killip & Smith 25938*).—Puno: Sandía, *Weberbauer 594.* Cuyo-cuyo, *Raimondi.* Tabina, *Lechler 1924a.* Churuhuasi, *Soukup 484.* Bolivia to Colombia and Venezuela.

Cavendishia punctatifolia (R. & P.) Hoerold, Bot. Jahrb. 42: 279. 1909; 480. *Thibaudia punctatifolia* R. & P. Fl. Peruv. 4: *pl. 387.* 1802. *T. punctata* R. & P. ex St. Hil. Expos. Fam. Nat. 363. 1805. *C. Kraenzliniana* Hoerold, l.c. 322, fide Smith.

Subscandent glabrous shrub, the smooth close-barked branches to 4 meters long; petioles subrugose, 6–10 mm. long, stout; leaves oblong, truncate at base, subacute to abruptly short-acuminate, entire, sometimes slightly revolute, 9–25 cm. long, half as wide, densely impressed punctate both sides, 7-plinerved, the nerves very prominent beneath; racemes elongate, 30–60-flowered, the many basal bracts to 2 cm. long, 1.5 cm. wide; rachis 1–3 dm. long in fruit; pedicels 1–2 cm. long; calyx extended at base, very rugose, the tube about 2.5 mm. long, the lobes about 1 mm. long; corolla greenish-white or greenish-yellow, 11–14 mm. long; stamens 9–10 mm. long, the sparsely puberulent distinct (or nearly) filaments 2.5 and 3.5 mm. long; anther sacs nearly smooth, 3–4 mm. long, the tubules about 5 and 4 mm. long; stigma peltate.—My collection from thickets, a slender plant 3–6 meters tall, the flowers white. As elsewhere, the vol. 4 of Ruíz and Pavón has been accepted as publication. Type by Dombey (Ruíz and Pavón) from central Peru. F.M. Negs. 37031; 4669 (*C. Kraenzliniana*).

Huánuco: Chaglla, *3632*.—Junín: Huacapistana, *Weberbauer 1972* (type, *C. Kraenzliniana*); *Killip & Smith 24256*. Carpapata, *Killip & Smith 24473*. Huassahuassi, *Ruíz & Pavón*, type.

Cavendishia Ulei Hoerold, Verh. Bot. Ver. Brandenb. 50: 93. 1908; 506.

Glabrous or the oblong leaves sparsely brown pilose beneath; petioles rugose, 7–9 mm. long; leaves rounded at base, short-acuminate, 10–13 cm. long, 3.5–5 cm. wide, 7-plinerved, some of the nerves originating well above the base, the midnerve prominent beneath, the veins reticulate; racemes short, 10–15-flowered, the younger more or less enclosed by the papyraceous bracts, these 2.5 cm. long, 1.5 cm. wide or smaller; pedicels 6–8 mm. long, the basal bract like those of the inflorescence; calyx tube 3–4 mm. long, the lobes 1.5–3 mm. long, glandular-margined; corolla about 16 mm. long (probably longer at maturity); stamens 13 mm. long, the glabrous filaments 1.5–2 and 3 mm. long; anther sacs 4 mm. long or shorter, a little granular, the membranous tubules 9 and 8 mm. long; stigma truncate.—Probably a variety of *C. nobilis*. F.M. Neg. 4681.

Cajamarca: Huancabamba, *Weberbauer 6122*. Near Socota, *Stork & Horton 10131*.—San Martín: Cerro de Escalero, *Ule 6789*, type.

Cavendishia Urbaniana Hoerold, Bot. Jahrb. 42: 329. 1909; 508.

Similar to *C. Ulei* but the somewhat larger leaves black punctate beneath, 7–9-plinerved, some of the nerves originating even as much as 5 cm. above the base; pedicels about 4 mm. long; corolla about 22 mm. long, the stamens nearly as long; filaments puberulent, 4 and 6 mm. long; anther sacs nearly smooth, 5 and 6 mm. long, the tubules 11 and 8 mm. long; stigma subpeltate. Upper leaves and flowers flesh-colored, the latter with white throat.—Perhaps, with *C. Ulei*, will prove to be a part of *C. nobilis*, but both have rather more oblong leaves. F.M. Neg. 4680.

Huánuco: Monzón, 1,600 meters, *Weberbauer 3518*, type.

17. ORTHAEA Klotzsch

Low shrubs with alternate more or less coriaceous or sometimes chartaceous leaves and axillary or terminal racemose flowers, or these sometimes only 1 or 2. Pedicels articulate with the calyx tube, the subtending bracts rarely conspicuous as in *Cavendishia*. Calyx typically not winged. Corolla cylindrical or nearly, typically 5-lobed. Stamens 10, the free (or rarely connate) filaments alternately unequal but the anthers equal or subequal, nearly smooth, the tubules about as long as the sacs, wide and opening by terminal or subterminal pores or wide oblique clefts.—A small group that exhibits characters intermediate to *Ceratostema* and relatives on one hand and to *Thibaudia* and relatives on the other. An interesting ally is *Lysiclesia* A. C. Sm., 517, consisting of two Colombian species marked by 3-winged, 3-lobed calyx, the lobes large; more or less analogous developments, purely morphological, however, are known in both *Satyria* and *Vaccinium*. The two species are *L. caudata*, leaves long-acuminate, and *L. minor*, leaves merely acute, both probably to be found in eastern Peru. A segregate less worth while is *Empedoclesia* Sleumer, Notizbl. Bot. Gart. Berlin 12: 124. 1934, the pedicels bibracteolate below the calyx as in *Disterigma!*

Flowers 2.5–3 cm. long.............*O. Engleriana, O. secundiflora.*
Flowers 1–2 cm. long.
  Flowers 15–18 mm. long.
    Leaves more or less pinnate-nerved...........*O. pinnatinervia.*
    Leaves clearly plinerved.
      Filaments glabrous, tubules 5 mm. long; indument rufous. *O. ignea.*
      Filaments subpilose, tubules shorter; indument pale.

Pedicels to 13 mm. long; calyx limb thick, sinuses acute. *O. Weberbaueri.*

Pedicels to 20 mm. long; calyx limb thin, sinuses rounded. *O. Ferreyrae.*

Flowers 1 cm. long............................*O. breviflora.*

Orthaea breviflora A. C. Sm. Contr. U. S. Nat. Herb. 28: 513. 1932.

Glabrous or the leaves early somewhat pilose beneath; petioles 4–6 mm. long; leaves ovate-oblong, rounded or broadly cuneate at base, acuminate, entire, rigid-coriaceous, obscurely 5–7-plinerved, 5–8 cm. long, 2–2.5 cm. wide; inflorescence subfasciculate or short racemes, 6–10-flowered; pedicels rugose, 4–6 mm. long with several membranous deciduous bractlets at base about 2.5 mm. long; calyx tube short, cylindric, 1.5 mm. long, the limb, including the 1 mm. long lobes, about 2.5 mm. long; corolla 1 cm. long, 3 mm. thick; stamens 3 and 3.5 mm. long; filaments membranous, densely pilose; anther sacs nearly smooth, 1 mm. long; tubules erect, wide, opening by terminal slightly flaring pores; stigma truncate.

Cuzco: Cerro de Cusilluyoc, *Pennell 13972*, type.

Orthaea Engleriana Hoerold, Bot. Jahrb. 42: 320. 1909; 514.

Branchlets, petioles and short racemes more or less puberulent, or in age glabrous; leaves oblong-lanceolate, about 1 dm. long, 2.5–3 cm. wide, rounded at base, acuminate, glabrous above, sparsely appressed pubescent beneath, 5–7-plinerved; racemes 6–10-flowered, subtended at base by several deciduous papyraceous bracts to 2 cm. long, 7 mm. wide; pedicels and rugose calyces sparsely white pilose, the former to 12 mm. long with 2 linear bractlets, the calyx tube 1.5–2 mm. long, equaled by the limb; corolla submembranous, glabrous or essentially, about 5 mm. thick, 3 cm. long, slightly contracted at both ends; stamens 7 and 8.5 mm. long, the basally connate, somewhat puberulent filaments 3.5 and 5.5 mm. long; tubules and sacs 2 mm. long, the former opening by terminal or subterminal pores; stigma truncate.—With the large bracts of many species of *Cavendishia* (but deciduous), the calyces rose-colored, the corollas roseate with white tips. It seems to be a part of *O. secundiflora.* Illustrated (stamens), Bot. Jahrb. 42: 266. F.M. Neg. 4731.

Amazonas: Moyobamba, *Weberbauer 4753*, type.

Orthaea Ferreyrae A. C. Sm. Journ. Wash. Acad. Sci. 43: 211. 1953.

Shrub to 5 meters tall, the branchlets (somewhat angulate above), petioles (2–5 mm. long) and axillary 10–20-flowered racemes (2–7 cm. long) more or less puberulent to glabrous; interpetiolar petioles now and then persisting, lanceolate, 2–5 mm. long; leaves lanceolate, (5–) 7–11 cm. long, 1.5–3 cm. wide, obtuse at base, attenuate to mucronulate apex, this 1–2 cm. long, incrassate entire margin often recurved, subcoriaceous, glabrous or obscurely glandular-strigose, or the midrib pilosulous, the little prominent basally oriented secondary nerves ascending; pedicels 1.5–2 cm. long, the bracts and bractlets caducous; calyx 5–7 mm. long and broad (at apex), subapophysate tube 2–3 mm. long, limb longer, papyraceous, sinuses of short teeth rounded; corolla cylindric, 18–21 mm. long, about 5 mm. in diameter, the 5 oblong-deltoid obtuse lobes 2–2.5 mm. long; filaments 3–4 and 5–8 mm. long, connate below, the longer ciliolate-puberulent, anthers 4–6 mm. long, tubules subequaling cells, dehiscing by oval clefts 1–2 mm. long.—Resembles most *O. pinnatinervia* Mansf. in flowers, *O. Weberbaueri* Hoerold in foliage, while it lacks the rufescent indument of the also related *O. ignea* Sleumer with smaller flowers. Corolla noted as red (in some degree), often white-tipped.

Huánuco: Carpish, 2,800 meters, (*Ferreyra 6709*, type). Divisoria, 1,500 meters, (*Ferreyra 1671*).—Junín: Huacapistana, (*Sandeman 4514; 4558; s.n.* June, 1938). Agua Dulce, *Woytkowski 35482.*

Orthaea ignea Sleumer, Notizbl. Bot. Gart. Berlin 12: 131. 1934.

Branchlets terete; petioles 4 mm. long; leaves elliptic-lanceolate, cuneate to nearly rounded at base, long-acuminate, 8.5–11.5 cm. long, 2– nearly 3 cm. wide, chartaceous, glabrous above, more or less appressed pubescent beneath, the midnerve and laterals there rather prominent; racemes glabrous, about 12-flowered, borne at defoliate nodes; pedicels stout, 7 mm. long at anthesis; calyx shortly apophysate at base, subcampanulate, 4 mm. long, the corolla subinflated, little contracted at throat, about 1.5 cm. long, 4 mm. thick; filaments slightly connate, glabrous, 1.5 and 2.2 mm. long, the anthers with the tubules 5 mm. long, the latter distinct, about 2 mm. long, with oblique apical pores.—Sleumer regards this as intermediate to *Cavendishia orthaeoides* and *C. pinnatinervia* and apparently, from description, it connects the groups and perhaps indicates that they, more realistically, constitute one genus.

Cuzco: Valle de Pillahuata, 3,350 meters, (*Herrera 3656*, type). Acanacu, Paucartambo, *Vargas 305*.

Orthaea pinnatinervia Mansf. Notizbl. Bot. Gart. Berlin 9: 438. 1925; 515.

Allied to *O. Weberbaueri* but subscandent, to 4 meters high; branchlets and petioles early puberulent, the latter 2–4 mm. long; leaves oblong, truncate at base, long-acuminate, subentire, sparsely pilose beneath, becoming glabrous, 4–7 cm. long, 1.5–2 cm. wide, pinnately nerved; racemes short, 8–15-flowered, the basal bracts to 5 mm. long; rachis rugulose, 1–2 cm. long; pedicels 5–8 mm. long, glabrous as the rugose calyx tube, this 2–2.5 mm. long, the limb including the lobes 3 mm. long; corolla pale red, greenish-white above, 15–18 mm. long; stamens 5 and 6.5 mm. long, the free filaments pilose; anther sacs slightly granular, about 2 mm. long, the tubules 2.5 mm. long, their oval pores or clefts half as long.—Species connects the genera *Orthaea* and *Cavendishia*.

Cuzco: Marcapata, *Weberbauer 7814* (det. A. C. Smith). Cosnipata, *Weberbauer 6925*, type.

Orthaea secundiflora (Poepp. & Endl.) Klotzsch, Linnaea 24: 24. 1851; 512. *Thibaudia secundiflora* Poepp. & Endl. Nov. Gen. & Sp. 1: 5, *pl. 9*. 1835.

Slender glabrous shrub with long, soon terete branches; petioles about 6 mm. long; leaves elliptic-lanceolate, 9–15 cm. long, 3–4 cm. wide, cuneate at base, acuminate, entire, 5-plinerved; racemes elongate, bracted basally, the slender rachis to 10 cm. long; pedicels 1–2 cm. long; calyx campanulate, 4 mm. long, the obtuse lobes sparsely glandular; corolla cylindrical-conical, 2.5 cm. long; filaments connate below, the longer ones pilose; anthers equal, sparsely setose at base, the slightly longer tubules opening by subterminal pores; stigma subglobose.—Calyx red or reddish, corolla entirely white or vermilion at base (Woytkowski). Apparently, ex char., *O. abbreviata* Drake, Journ. de Bot. 3: 75. 1889, from Ecuador is the same.

Huánuco: Between Casapi and Cuchero, *Poeppig*, type. Divisoria, *Woytkowski 513; 521* (det. A. C. Smith). Ecuador.

Orthaea Weberbaueri Hoerold, Bot. Jahrb. 42: 320. 1909.

Compact, to 3 meters tall, the terete branchlets and rugose petioles glabrous, the latter 4–6 mm. long; leaves oblong or lanceolate-oblong, 8–12 cm. long, 2.5–3.5 cm. wide, more or less rounded at base, acutely acuminate, entire and narrowly revolute at margins, glabrous above, sparsely appressed pilose beneath, 5–7-plinerved, the veins densely reticulate; racemes 15–25-flowered, the rachis 3–5 cm. long; pedicels rugose, 8–13 mm. long, the basal bractlets minute; calyx tube strongly rugose, 2.5 mm. long, the lobes 1–1.5 mm. long; corolla 15–18 mm. long; stamens 4.5 and 6.5 mm. long, the pilose filaments loosely coherent below, 2.5 and 4 mm. long; anther sacs 1.5 mm. long, the tubules about 1 mm. long opening by wide clefts nearly as long.—Flowers dark rose with white tips.

Puno: Sandía, 2,900 meters, *Weberbauer 684*, type. Bolivia. "Huilunto."

18. SATYRIA Klotzsch

With the habit of other genera but marked as to floral structure by the firmly connate filaments, the alternately unequal anthers crowded together on the top of the filament tube, rigid, the sacs and tubules scarcely differentiated, the latter with broad or elongate lateral clefts.—Intermediate to *Ceratostema* and *Thibaudia* via *Themistoclesia* and merely an extreme development of characters occurring in varying states in several series and therefore scarcely a natural group.

Flowers large, the plants glabrous.................. *S. panurensis.*
Flowers small, the plants more or less pilose.
  Inflorescence many-flowered...................... *S. polyantha.*
  Inflorescence 1–2-flowered....................... *S. Vargasii.*

Satyria panurensis (Benth.) Benth. & Hook. f. Gen. Pl. 2: 568. 1876; 522. *Thibaudia panurensis* Benth. ex Meissn. in Mart. Fl. Bras. 7: 125. 1863. *S. Ulei* Hoerold, Verhandl. Bot. Ver. Brandenb. 50: 93. 1908.

Completely glabrous or the young calyces and corollas a little farinose apically; petioles 4–6 mm. long; leaves ovate to oblong, subcordate to subcuneate at base, acuminate, 10–13 cm. long, 3–6 cm. wide, entire, lustrous, 3–5-plinerved; racemes 8–20-flowered, the rachis to 4 cm. long; pedicels 8–11 mm. long, the bractlets fimbriate, about 1 mm. long; calyx tube 2 mm. long, the limb with lobes about as long; corolla 16–31 mm. (finally 2–3 cm.) long, about 3 mm. thick; stamens 7.5–10 and 8.5–11 mm. long; connectives slender, minutely pilose, the anther 5–7 and 6–8 mm. long, produced at base, the large oval clefts 1.5–2 mm. long; stigma truncate.—F.M. Negs. 26654; 4722 (*S. Ulei*).

San Martín: Cerro de Ponasa, *Ule 6672* (type, *S. Ulei*). Tarapoto, *Williams 5959*.—Loreto: Mouth of Río Santiago, *Tessmann 4662*. Río Nanay, *Williams 934; 1108*. Brazil and Colombia to British Guiana and Ecuador.

Satyria polyantha A. C. Sm. Bull. Torrey Club 60: 119. 1933.

Terete rigid branchlets as the rugose petioles, these 4–7 mm. long, early minutely puberulent; leaves elliptic-oblong, cuneate at base, acute or subacute, 4–6 cm. long, 2–2.5 cm. wide, coriaceous, pilose beneath, glabrous above or the pinnate impressed nerves puberulent, these prominent beneath, the margins thick, entire; inflorescence 10–25-flowered, densely and persistently ashy-tomentose, the rachis 1–3 cm. long, the bractlets 2–4 mm. long, glandular-margined; calyx tube 1.5–2 mm. long, the limb with the deltoid lobes 1–1.5 mm. long; corolla 3.5–5 mm. long, about half as thick; stamens 3.5 and 4 mm. long; anthers minutely setose at base, 2.7 and 3.2 mm. long, dehiscing by elongate-ovate chinks, the tubules little longer than the cells; stigma truncate.—Berries edible (Raimondi). *S. neglecta* A. C. Sm. 520, of Bolivia, has glabrous racemes with slightly larger flowers and stamens. *S. leucostoma* Sleumer, Bot. Jahrb. 71: 407. 1941, of Ecuador is glabrous as the similar *S. minutiflora* A. C. Sm. 529, but the leaves of the former have subpinnate nervation.

Puno: Tabina, *Lechler 2068*, type. Between Ollachea and Tabina, (*Raimondi*). Between Sandía and El Valle Grande, (*Raimondi*). "Huilunto" (Raimondi).

Satyria Vargasii A. C. Sm. Journ. Wash. Acad. Sci. 43: 212. 1953.

Shrub to 2 meters high, with subterete branchlets, petioles (1–2 mm. long), pedicels (to 12 mm. long), calyces (about 4.5 mm. long), and corollas (10–12 mm. long) minutely puberulent; leaves glabrous, elliptic, rounded or broadly obtuse at base, rounded at apex, 2–3 cm. long, 13–18 mm. wide, the 5–7 basal nerves rather prominent above; inflorescence 1–2-flowered, calyx about 5 mm. across at top, the cupulate tube 1.5–2 mm. long, limb thin, deeply 5-lobed, the ovate deltoid apiculate lobes 2–2.5 mm. long, sinuses acute; corolla about 4 mm. in diameter, glabrous within as the stamens, these 5.5 and 6 mm. long, the filaments 2.5 mm. long, connate, anthers 3.7 and 4.2 mm. long, tubules and cells subequal, the dehiscence by oval chinks 1–

1.5 mm. long.—Superficially suggestive of *Thibaudia biflora* (P. & E.) Hoer. but its staminal characters make its assignment to *Satyria* imperative; perhaps nearest the very different *S. polyantha* A. C. Sm. (author).

Cuzco: Sanamayco to Tambomayo, Prov. Paucartambo, 1,360 meters, (*Vargas 6493*, type).

19. GAYLUSSACIA HBK.

Like *Vaccinium* but the 5–10-celled ovary with a single pendulous ovule in each cell, the fruit berry-like (a drupe) with usually 10 nutlet-like seeds. Anthers never aristate.—Sleumer remarked (1941) that a revision is still lacking. The Peruvian species belongs to the section *Eulassia* Hook. f. with persistent leaves that are punctate stipitate glandulose beneath, the flowers mostly in axillary racemes. *G. microphylla* Don is *Vaccinium acuminatum.* Named for Gay-Lussac, chemist and member of the Academy.

Gaylussacia peruviana Sleumer, Bot. Jahrb. 71: 385. 1941.

Branchlets terete, the younger grayish-pilose as also the petioles, these about 1.5 mm. long; leaves oblong-elliptic, obtuse but gland-tipped, broadly cuneate or somewhat rounded at base, 12–18 mm. long, 7–9 mm. wide, distinctly and regularly crenate, more or less puberulent-pilose above, shortly glandular-pilose beneath with some laxer trichomes intermixed; racemes scarcely 1 cm. long, 3–7-flowered, densely pilose; pedicels 1.5–2 mm. long; basal bracts oblong, 2.5 mm. long, membranous, glabrous dorsally, the margins and inner surface pilose; calyx campanulate, deeply 5-lobed, pilose especially at base, the deltoid acuminate lobes glabrous within, 2.5 mm. long; corolla urceolate, 6 mm. long, red, crisply pubescent and with a few stipitate glands, the broad obtuse lobes reflexed, 1 mm. long; stamens 10, equal, 5 mm. long, the filaments densely long-pilose, the anthers granular with tubules 2 mm. long and distinctly narrower than the sacs; style filiform, the stigma truncate.—Differs from *G. buxifolia* HBK. of Colombia and Venezuela in the crenate leaves and less glandular racemes. *G. loxensis* Sleumer, l.c. 384, is similar but has glabrous flowers and nearly glabrous racemes. *G. amazonica* Huber, Bull. Soc. Bot. Genève sér. 2. 1: 248. 1909, is hispid, the leaves sublinear, 2–4 cm. by 4–7 mm., the calyx lobes broadly triangular-deltoid, abruptly caudate-acuminate, much like those (from drawing) of *G. peruviana;* it may well be the earliest name, and corolla lobes semiorbicular. Or, it seems possible, more collections will show the Sleumer plants to be variants in pubescence of *G. buxifolia.*

Amazonas: Pass of Piscohuanuna, Chachapoyas, 3,000 meters, (*Sandeman,* type).

20. **BEJARIA** Mutis

Acunna R. & P. Prodr. 69, *pl. 12.* 1794.

Reference: Mansfeld & Sleumer, Notizbl. Bot. Gart. Berlin 12: 235–276. 1935.

Much branched shrubs, rarely trees, with alternate entire or obscurely denticulate evergreen leaves and rather large or showy purple roseate or white flowers borne in terminal or subterminal racemes or corymbs. Calyx deeply 7- (5–8-) parted, the short ovate lobes enclosing the base of the erect capsule, this septicidally 7-valvate, many-seeded. Petals usually 7, free, suberect or spreading. Stamens 12–20, the elongate filaments usually dilated below, sometimes there slightly coherent, the oblong dorsifixed awned anthers obliquely bipored. Ovary glabrate, 7-sulcate, 6–7-celled with elongate glabrous style, the stigma depressed capitate, more or less 7-sulcate.

The name commemorates a friend of Mutis, a physician and botanist of Cadiz, José Bejar. The genus was published by Linné f. by error as *Befaria* (cf. Sprague, Kew Bull. 347. 1928); Mansfeld and Sleumer used the Linnaean spelling. It seems to me unnecessary to perpetuate this mistake. There are many similar instances. It is especially unfortunate here since the plants are native to regions where the Spanish origin of the name will always be appreciated, and to obscure it by error would be a pity. I have compiled largely from the monographers who have handled carefully a difficult taxonomic problem which, however, with the aid of genetic studies may be resolved somewhat differently, for the development of pubescence and glands will very doubtfully be proven to be a basic indicator of species. It is not clear if one admits variation in indument for *B. oblonga* (i.e., *B. glauca*) how the character can be diagnostic in itself for other "species"; the actual genetic species are probably three or four.

Another key has been prepared in the interest of simplicity for the more typical specimens of the Peruvian forms but as indicated by the monographers some material seems to show mingling of species perhaps locally established, whether one stresses the size of the flowers—in Peru at least, apparently more constant—or the character of the indument.

KEY TO BEJARIA (after Mansfeld and Sleumer)

Pedicels glandular pubescent.
  Leaves densely pubescent beneath or oblong-elliptic and obtuse.
    Pubescence of leaves beneath eglandular, tomentose.
      Leaves 1–2.5 cm. long; inflorescence laxly racemose. *B. sandiensis.*
      Leaves 2–3.5 cm. long; inflorescence corymbosely contracted. *B. cinnamomea.*
    Pubescence of leaves beneath glandular-pilose or -hispid.
      Rachis not at all leafy . . . . *B. hispida.*
      Rachis leafy-bracted . . . . *B. Sprucei.*
  Leaves, at least at maturity, glabrous or glabrate beneath unless the nerves, the younger often more or less pubescent or ovate-elliptic and acuminate.
    Leaves mostly shorter than 2 cm. . . . . *B. peruviana.*
    Leaves mostly 3 cm. long or longer . . . . *B. oblonga.*
Pedicels eglandular or glabrous.
  Petals usually less than 2 cm. long; leaves broadly oblong.
    Calyx lobes and usually the leaves obtuse . . . . *B. oblonga.*
    Calyx lobes acute or subacute, the leaves usually acuminate. *B. Mathewsii.*
  Petals usually more than 2 cm. long; leaves ovate or linear-oblong.
    Petals 2–2.5 (3) cm. long; pedicels tomentose and resinous hispid. *B. resinosa.*
    Petals 3–3.5 cm. long; pedicels tomentose.
      Leaves glabrous . . . . *B. Weberbaueriana.*
      Leaves tomentose beneath . . . . *B. Mathewsii.*

ALTERNATE KEY TO BEJARIA

Leaves at least mostly, about twice longer than wide; inflorescence more or less glandular.
  Flowers about 2 cm. long, or shorter, or the inflorescence bracted.
    Inflorescence bracted below by the reduced upper leaves. *B. Sprucei.*
    Inflorescence not leafy-bracted, the leaves usually 2 cm. long or longer.
      Indument predominately hispid . . . . *B. hispida.*

Indument predominately tomentose..........*B. sandiensis.*

Flowers after anthesis 2.5–3 cm. long.

Leaves densely tomentulose beneath..........*B. cinnamomea.*

Leaves soon glabrous or nearly.................*B. peruviana.*

Leaves about three times longer than wide; inflorescence tomentose, eglandular or viscid except *B. oblonga.*

Petals becoming 3 cm. long or longer; indument mostly or entirely tomentose, sometimes viscid-villous.

Leaves more or less deciduously tomentose beneath. *B. Mathewsii.*

Leaves glabrous or nearly; pedicels short-tomentulose, few if any longer trichomes....................*B. Weberbaueriana.*

Leaves sparsely hirtellous beneath; pedicels viscid-villous. *B. resinosa.*

Petals typically about 2 cm. long or shorter or if rarely about 3 cm. long, indument typically viscid or glandular.

Petals typically attaining at most 2 cm.; indument variably stipitate glandular, tomentose or lacking..........*B. oblonga.*

Petals typically to 3 cm. long; indument eglandular but that of pedicels tomentose and resinous-hispid........*B. resinosa.*

Bejaria cinnamomea Lindl. Gard. Chron. 175. 1848; 270.

Branchlets more or less densely glandular-hirsute as also the rachi and pedicels—these 1.5, rarely 3 cm. long—of the corymbose-contracted inflorescence, this about 4 cm. long and about 8-flowered; petioles stout, 2–3 mm. long; leaves elliptic, rarely somewhat ovate, minutely narrowed at base or sometimes subrotund, acutish or obtuse, 2–3.5 cm. long, 8–15 (22) mm. wide, nearly always glandular-ciliate marginally, when mature green and glabrous or merely puberulent above, more or less cinnamon-colored or less frequently yellowish-gray tomentose (rarely glabrate) beneath, not at all glandular unless a few setae on the midnerve; calyx glandular-pilose especially at base, the ovate subacute lobes 4–5 (6) mm. long; petals erect, obovate-oblong, nearly glabrous, 2.5 (2–3) cm. long, the stamens as long.—Illustrated, Humb. & Bonpl. Pl. Aequin. 2. *pls. 118, 119* as *B. aestuans*); Fl. des Serres, 4: *pl. 328b.* F.M. Neg. 28910; 31953.

Cajamarca: (*Lobb*, type).—Amazonas: Tulia, (*Mathews 1423*, part). Chachapoyas, *Mathews 1424*, part; *3040; Woytkowski.* Quebrada de St. Lucía, *Stuebel 21a.* Leimebamba to Calla Calla (*Raimondi*). Ecuador.

Bejaria hispida Poepp. & Endl. Nov. Gen. & Sp. 1: 24, *pl. 39.* 1835; 275.

Glandular-hispid even to the calyces, the older leaves sometimes glabrate on the faces but at least the midnerve somewhat glandular pubescent; petioles 2–3 mm. long; leaves usually oblong-elliptic shortly narrowed at base, obtuse, sometimes submucronulate, lustrous above, mostly 2–3.5 cm. long, 1–2 cm. wide, more or less glandular-ciliate-denticulate; inflorescence usually racemose, many-flowered, the pedicels ordinarily slender, 1.5–3 cm. long; calyx 4 mm. long, the ovate obtuse lobes spreading or even reflexing; petals red or roseate 1.5–2 (2.5) cm. long, the stamens as long, the filiform style little exserted.—Attains 3 meters; the pubescence, at least in herbarium, is dark or black in color. Illustrated, Bot. Mag. 75: *pl. 4433* (as *B. coarctata*).

Cajamarca: Limón to S. Ignacio, Prov. Jaén, *Raimondi.*—Amazonas: Chachapoyas, *Raimondi.*—La Libertad: Mixiollo Valleys, 2,000 meters, *Weberbauer 7406.*—San Martín: Acomayo to Moyobamba, *Raimondi.*—Huánuco: Cuesta de Carpish, *Poeppig,* type. Huamalies, 2,400 meters, *Weberbauer 3419.* Cuchero, *Dombey.*—Junín: North of Comas, *Weberbauer 6683.* Uchubamba, *Raimondi.* —Puno: Ipaco to Tambopata, *Raimondi.* Bolivia to Colombia and Roraima.

Bejaria Mathewsii Field. & Gardner, Sert. Pl. 1: *pl. 69.* 1844; 259.

Branchlets, leaves beneath, and corymbs, including the calyces, more or less densely grayish- or yellowish-tomentose; leaves elliptic-oblong, narrowed into the very short petioles, shortly (sometimes bluntly or scarcely) acuminate, 2.2–3.5 (5) cm. long, 8–14 mm. wide, glabrous and somewhat lustrous above; pedicels stout, 1–1.5 (2.5) cm. long; calyx lobes 7, ovate-deltoid, subacute (or rarely obtuse), about 4 mm. long; petals about 3 cm. long, 6 mm. wide, rarely 3.5 cm. long, about 7 mm. wide, equaled by the stamens, the style little exserted. —The larger-flowered state is the forma *pulcherrima* Mansf. & Sleumer. They have suggested that the species probably passes to *B. glauca* var. *tomentella* (see under *B. oblonga*) since the type number at Kew and at Stockholm has branchlets with blunter leaves. In my original manuscript it was placed as a variant of *B. glauca.* It also is comparable to *B. aestuans* Mutis, maybe extending south into Peru. Sometimes 4 meters high.

Cajamarca: Cutervo, *Raimondi.* Between Cajamarca and Yanacancha, *Raimondi.* Between Chota and Cutervo, *Raimondi* (the form).—Amazonas: Chachapoyas, *Mathews 1426,* type. Taulia, *Mathews 1423* (part). Sesuya, (*Mathews 3039*). Vilya to Conila, 3,200 meters, *Weberbauer 3624* (type, forma *pulcherrima*); also *7144.*

Bejaria oblonga (R. & P.) Pers. Syn. 2: 3. 1806. *Acunna oblonga* R. & P. Syst. 123. 1798; 251. *A. lanceolata* R. & P. l.c. 124, at least in part. *B. lanceolata* (R. & P.) Pers. l.c. *B. glauca* Humb. & Bonpl. Pl. Aequin. 2: 118, *pl. 117.* 1809. *B. coarctata* Humb. & Bonpl. l.c. 125, *pl. 121. B. pallens* Remy, var. *tarapotana* Meissn. in Mart. Fl. Bras. 7: 170. 1863. *B. glauca* var. *glandulosa* Mansf. & Sleumer, l.c. 257.

Shrub or small tree, variable in pubescence but typically the branches and racemose or corymbose-fastigiate inflorescences are more or less deciduously hispid- or pilose-glandular, the leaves glabrous or usually, but, especially beneath on the midnerve and margins, glandular; petioles 2–3 (6) mm. long; leaves oblong or elliptic-oblong, obtuse or rarely acutish, slightly narrowed at base, somewhat glaucous beneath, only the midnerve prominent, (2) 3–4 (10.5) cm. long, 1–1.5 (2.5) cm. wide; pedicels 2–3.5 cm. long; bracts narrow, about 2 mm. long; calyx 3–4 mm. long, the 7 (6–8) segments obtuse, about 2 mm. long; petals obovate-cuneate, spreading, glabrous, 15–18 mm. long, about a third as broad (or apparently rarely much larger); stamens about as long, the style little or scarcely exserted; capsule depressed-globose, glabrous, about 6 mm. across.

The authors of the revision used *B. glauca* as the basic name; this later cognomen applies to the glabrous or nearly glabrous form known from Bolivia and Colombia and apparently from Peru. The type of *B. oblonga* consists of a densely glandular and a nearly smooth branchlet, so that the character as elsewhere is of little importance. More striking and more common variants as defined by Mansfeld and Sleumer include *B. coarctata* Humb. & Bonpl. l.c. (i.e., *B. glauca* var. Mansf. & Sleumer, l.c. 253), branchlets and more crowded inflorescences densely rusty tomentose not glandular (cf. *B. resinosa*); similar but leaves tomentose beneath is *B. pallens* Remy, Ann. Sci. Nat. sèr. 3. 8: 229. 1847 (*B. glauca* var. *tomentella* Mansf. & Sleumer, l.c. 255). Better marked still is *B. glauca* var. *setosa* Mansf. & Sleumer, l.c. 256, pedicels and usually the branchlets more or less hispid or setose, the midnerve of the leaves beneath densely so, the leaf faces glabrate or tomentulose. This last variety approaches *B. subsessilis* Benth. of Ecuador, branches densely setose, petals 2–2.5 cm. long. The entity in all probability is a part of *B. resinosa.* Shrub or small tree. Illustrated, Bot. Mag. 83: *pl. 4981* (var. *pallens,* as *B. Mathewsii*). F.M. Neg. 28914.

Cajamarca: Paramo de Yanaguanga, *Bonpland* (type, *B. coarctata*). Chota to Ninabamba, (*Raimondi,* var. *coarctata*). Huambos, Prov. Chota, 2,200 meters, *Weberbauer 4300* (var. *pallens*). Cutervo, (*Raimondi; Jelski,* typical); *Stork & Horton 10125.* Near Angura, (*Raimondi*). Tambillo, (*Raimondi 6008,* leaves red-brown tomentose as in *B. sandiensis,* fide Mansf. & Sleumer).—Amazonas: Chachapoyas region, *Mathews 3039,* part; *1425; 1424* (var. *pallens,* the last number in part typical). Valle de Huayabamba, (*Raimondi,* var. *pallens*).—San Martín: Rioja, 900 meters, *Weberbauer 4709* (var. *coarctata*). Tarapoto, *Spruce 4252* (var. *setosa,* type *B. pallens* var. *tarapotana*).—Huánuco: Huánuco or Hualsca, *Ruíz & Pavón* (type, *A. lanceolata,* this in part *B. resinosa* fide Mansf. & Sleumer). Churupallana, Macora, Pillao & Chinchao, *Ruíz & Pavón; Tafalla* (type *A. oblonga;* the Tafalla species type *B. glauca* var. *glandulosa*). Pillao, *Woytkowski 21.*—Junín: Palca and Chanchamayo, *Weberbauer 1917; Isern; Raimondi 2834* (first two, var. *coarctata,* last typical). Huacapistana, *Killip & Smith 24243; 24213; 24779.* Colonia del Perené to Tarma, *Killip & Smith 24976; Weberbauer* without number, typical. Agua Dulce, *Woytkowski 35470.*—Cuzco: Lucmayoc, (*Herrera 1727,* type, var. *tomentella*); *Herrera 1750* (var. *coarctata*). Valle de Urubamba, *Weberbauer 5056* (var. *coarctata*). Mouth of Río Pampos, *Weberbauer 5881* (var. *pallens,* as all following except noted). Marcapata Valley, 1,900 meters, *Weberbauer 7837.* Cerro de Cusilluyoc, 2,700 meters, *Pennell 14085.*—Puno: Sandía, (*Raimondi,* var. *setosa*). Sagrario, *Metcalf 30628* (*B. glauca*). Limbani, *Metcalf 30510.* Tabina, *Lechler 1929.* Bolivia to Colombia and Venezuela. "Congama."

Bejaria peruviana Mansf. & Sleumer, Notizbl. Bot. Gart. Berlin 12: 268. 1935.

Similar to *B. hispida* but rather less pubescent and, especially, the leaves ovate-elliptic (rarely elliptic), subsessile at the subrotund base and shortly acuminate, glabrous or nearly above, only the midnerve glandular pilose beneath except the younger, 8–20 mm. long, 5–10 mm. wide; pedicels stout, 1.5–2 cm. long; calyx lobes elongate-deltoid, obtuse, about 5 mm. long; petals 3 cm. long or somewhat longer, the style and stamens little exserted.—Perhaps a glabrate state of *B. cinnamomea* or a large-flowered form of *B. hispida,* to which the Williams collection has been referred. Type half a meter high.

Cajamarca: East of Huancabamba, 2,800 meters, *Weberbauer 6106,* type.—Amazonas: Chachapoyas, *Williams 7552.* Ecuador. "Payama" (Steyermark, Ecuador).

Bejaria resinosa Mutis ex L. f. Suppl. 246. 1781; 264, at least as to Peru. *B. caxamarcensis* HBK. Nov. Gen. & Sp. 3: 294. 1819, fide Mansf. & Sleumer. *Acunna lanceolata* R. & P. Syst. 124. 1798 in part, fide Mansf. & Sleumer.

Much branched shrub to 3 meters high, the younger branchlets more or less densely rusty tomentose with also some longer hispid trichomes; petioles to 2 mm. long; leaves usually ovate-oblong, rounded or sometimes broadly cuneate at base, gradually acuminate or rarely obtuse, 2–2.5 (3) cm. long, 8–12 mm. wide, glabrous at least above and green and lustrous, hirtellous nearly always beneath on the midnerve, sometimes also on the face; inflorescence a corymb, ordinarily crowded; pedicels 1–1.5 cm. long, densely rusty tomentose, somewhat resinous or viscid hispid but not glandular; calyx tomentose and hirtellous, the subacuminate lobes about 4 mm. long; petals purple, rather resinous and slightly white-pubescent at tip, 2–3 cm. long, 5–6 mm. wide, the stamens about as long, the style little exserted, its stigma lightly pubescent.—Besides the Bonpland specimen, Lobb as well as Ruíz and Pavón obtained it apparently at some unnamed localities in Peru. *B. glandiflora* Humb. & Bonpl. of Ecuador has leaves that are densely tomentose beneath. F.M. Negs. 28915; 38217.

Cajamarca: In the Andes of Cajamarca, *Bonpland* (type, *B. caxamarcensis*). To Colombia.

Bejaria sandiensis Mansf. & Sleumer, Notizbl. Bot. Gart. Berlin, 12: 273. 1935.

Shrub one meter high, the branchlets and petioles (2 mm. long) densely rusty glandular tomentose; leaves subovate-elliptic, usually subrotund at both ends or slightly narrowed at base and to an obtuse tip, 1–2.5 cm. long, 6–15 mm. wide, ashy puberulent and with scattered long glandular trichomes above, densely tomentose beneath, the margin closely glandular pilose; racemes lax, to 1 dm. long, glandular villous to the calyces, the slender pedicels to 2.5 cm. long; calyx lobes only about 2 mm. long, ovate, obtuse; petals nearly glabrous, to 2 cm. long, the stamens and style little longer.—Morphological characters intermediate to *B. hispida* and *B. cinnamomea* (authors).

Puno: Rock outcrops, 2,200 meters, (*Weberbauer 659,* type). "Chinichini."

Bejaria Sprucei Meissn. Mart. Fl. Bras. 7: 171. 1863; 274.

Distinctive among Peruvian species by the leafy-bracted racemes, the bracts gradually decreasing in size into the 10–12-flowered densely glandular-hispid racemes; leaves obovate-oblong, abruptly attenuate to the 1–2 mm. long petioles, narrowed to the obtusish or rounded tips, soon glabrous and lustrous above, glandular-pilose and on the nerves hispid beneath, 1.5–2.5 cm. long, 8–13 mm. wide; pedicels nearly filiform; calyx scarcely 2.5 mm. long, the ovate obtuse segments ciliate; petals red or pink, oblong, sometimes a little resinous, 1–1.5 cm. long, slightly exceeded by the stamens and filiform glabrous style.—Attains 1.5 meters. F.M. Neg. 22760.

San Martín: Tarapoto, *Spruce 3994,* type; *Williams 5996; 5991.* Cerro de Escalero, 1,000 meters, *Ule 6388.* Near Moyobamba, 1,400 meters, *Woytkowski 35278* (det. A. C. Smith); *Weberbauer 4589;* in open sandy savanna woods, 1,000 meters, *Weberbauer 4612; Klug 3251* (det. Standley). Tarapoto to Moyobamba, (*Raimondi*). San Roque, *Williams 7658.*

Bejaria Weberbaueriana Mansf. & Sleumer, Notizbl. Bot. Gart. Berlin 12: 261. 1935.

Flowers showy, borne densely in racemose-corymbose rusty tomentose inflorescences 4–5 cm. long, the rose-colored petals glabrous, 3–3.5 cm. long, to 1 cm. wide; branchlets more or less tomentulose; leaves narrowly oblong, narrowed to the short (rarely 2 mm.) petioles, gradually acuminate, usually 2–2.5 cm. long, 4–7 mm. wide, glabrous, glaucous beneath; pedicels 1.5 (2) cm. long; calyx glabrate or laxly tomentose, the ovate, obtuse lobes 3–4 mm. long; stamens as long as the corolla, the style obviously exserted before anthesis, elongating. Indument without long trichomes or few.—In view of variation elsewhere this shrub is probably a form of *B. caxamarcensis,* i.e., *B. resinosa,* fide Mansfeld and Sleumer. Illustrated, Weberbauer, 236 (as *B. caxamarcensis*). F.M. Neg. 28917.

Cajamarca: Above the Hacienda La Tahoma near Hualgayoc, 3,100 meters, (*Weberbauer 4014,* type). Ecuador. "Pulunrosa."

21. PERNETTYA Gaudichaud

Reference: Sleumer, Notizbl. Bot. Gart. Berlin 12: 626–655. 1935.

Like *Gaultheria* but the fruit a berry and, as regards the single species of Peru, the calyx remains small beneath the fruit and the corolla is short-campanulate, little if at all narrowed at the summit. Flowers white, often rose-tinged, ovoid edible berry with blackish to pale or roseate flesh in contrast to the capsular fruit of *Gaultheria* which otherwise is so similar. The constancy of this distinction suggests that groups allied to *Vaccinium* may be shown to have fruit-characters, but I think they are not known to be definitely marked as here, even if they are correctly understood. Named for Antoine Joseph Pernetty, a Benedictine abbé who accompanied Bougainville to South America in 1763 and published an account of the journey.

Pernettya prostrata (Cav.) Sleumer, Notizbl. Bot. Gart. Berlin 12: 289. 1935; 643. *Andromeda prostrata* Cav. Icones 6: 43, *pl. 562.* 1801. *Gaultheria myrsinoides* HBK. Nov. Gen. & Sp. 3: 283. 1819. *P. purpurea* G. Don, Gen. Syst. 3: 837. 1834. *P. Pentlandii* DC. Prodr. 7: 587. 1839. *P. elliptica* DC. l.c.

More or less compact sprawling-ascending to suberect shrub a dm. to 2 meters high, the densely leafy branchlets usually tortuous; leaves typically elongate-elliptic, 4–7 mm. long, 1.8–2.5 mm. wide, or sometimes 2–3 times larger, always more or less crenate and nerved, usually acutish at base and tip; pedicels often sparsely glandular-setose, 4–6 mm. long; calyx lobes ovate, acute, about 2 mm. long, the campanulate-subglobose corollas twice as long. Flowers sometimes white as also the fruits, these usually black, purple or roseate.—The typical leaf-form (by Née from Ecuador) has been designated by Sleumer var. *eu-prostrata.* Besides, herbarium material has been sorted into several varieties which may be ecological states since they seem to have no geographic separation: vars. *purpurea* (Don) Sleumer, *elliptica* (DC.) Sleumer, *myrsinioides* (HBK.) Sleumer and *Pentlandii* (DC.) Sleumer. The first, according to Sleumer, includes specimens with leaves 10–15 mm. long, 4–5 mm. wide, the branchlets often bristly, the second similar but with leaves 6–8 mm. wide, the third with leaves 15–20 mm. long, 5–9 mm. wide, the nerves usually prominent above, and finally the fourth with leaves 12–20 mm. long but only 2.5–5 mm. wide, a frequent form and probably the only one worthy of some taxonomic recognition. Only a few of the many collections of this common plant of wet uplands are cited. Illustrated, Bot. Mag. 101: *pl. 6204* (var. *purpurea,* fide Sleumer); Poepp. & Endl. Nov. Gen. & Sp. 1: *pl. 41* (var. *Pentlandii,* fide Sleumer). F.M. Negs. 8625; 29344; 29345 (*P. purpurea*); 4591 (*P. elliptica*); 26651 (*P. pilosa*).

Its fruits when eaten in excess are intoxicating; for this reason they gave it the name "macha-macha" (Ruíz & Pavón).

Cajamarca: Region of Socota, *Stork & Horton 10186.* Cutervo, *Raimondi* (vars. *purpurea, elliptica*).—Amazonas: Near Chachapoyas, *Raimondi; Mathews* (as *P. pilosa,* a Mexican species).—La Libertad: South of Arenillos, 3,500 meters, *West 8160; 8161.* Collai, (*Raimondi,* var. *Pentlandii*).—Ancash: Above Ocros, 3,600 meters, *Weberbauer 2770* (var. *elliptica*). Near Yungay, *Weberbauer 3280* (var. *Pentlandii*); *3274* (var. *purpurea*).—Huánuco: Carpish, *Stork & Horton 9916.* Pillao and Churupallano, *Ruíz & Pavón* (type, *P. purpurea*). Tambo de Vaca, *4448; 3573* (var. *purpurea*). Mito, *3346* (var. *Pentlandii*); *1509; 1819; 1851; 1899.*—Junín: East of Huancayo, *Stork & Horton 10221; Raimondi* (var. *Pentlandii*). Tarma, *Ruíz & Pavón; Dombey* (type, *P. elliptica*). Near Palca, *Isern* (var. *purpurea*); *Weberbauer 2441a.* West of Huacapistana, *Weberbauer 2243.*—Lima: Río Blanca, *795* (var. *elliptica*). Near Canta, *Pennell 14694.*—Loreto: S. Catalina, between Ríos Huallaga and Ucayali, (*Raimondi*).—Ayacucho: Between Saucos and Chavina, (*Raimondi,* var. *myrsinioides*); same var. at Corcora, *Weberbauer 5802.* Hacienda Tortorabamba, *Weberbauer 5774* (var. *Pentlandii*). Near Huanta, *Raimondi.*—Apurímac: Cochacaya, 3,800 meters, *West 3780.*—Cuzco: Valle del Paucartambo, *Herrera 2317; Vargas 21; 308.* Valle del Urubamba, *Herrera 3438.* Paso de Tres Cruces, *Pennell 13836.* Acanacu Pass, *West 7027.*—Puno: Between Poto and Ananca, *Weberbauer 975* (var. *purpurea*). Agapata, *Lechler 1855* (var. *purpurea*). Apachetca, (*Raimondi,* var. *elliptica*). Near Limbani, *Vargas 9664; Metcalf 30444.* Islands of Lake Titicaca, (*Raimondi,* var. *Pentlandii*). Venezuela and Costa Rica to Chile. "Macha-macha."

22. GAULTHERIA [Kalm] L.

Evergreen shrubs, sometimes small and semi-decumbent, often much branched, less frequently open, usually coarsely pubescent or sparsely setose. Leaves very rarely opposite, denticulate or entire. Flowers small, white to red, sometimes 6-merous, urceolate or campanulate, axillary, solitary or racemose, the racemes in part terminal, bracteate and usually bracteolate, the bractlets often connate. Calyx ordinarily accrescent and enclosing the fleshy and edible or baccate 5-valved, rarely indehiscent depressed capsule. Stamens 10, rarely 8, included, the often basally dilated filaments cohering to corolla base, glabrous or pilose, the 2-celled anthers with often recurved bidentate tubules, rarely biaristate dorsally, the pores terminal or oblique.—Commemorates Hugues Gaultier (name written variously), physician and botanist of Quebec.

Several of the species are of doubtful validity since they rest on characters of pubescence and glandulosity, characters probably, as in *Bejaria*, of questionable integrity. The Guatemalan and Mexican species keyed by Sleumer, Notizbl. Bot. Gart. Berlin 12: 285–287. 1935, his work followed basically by Camp, Bull. Torrey Club 66: 9. 1939, were divided into the *Acuminatae*, indument, if present, a puberulence, minutely if at all glandular, and the *Odoratae*, rachis hirsute, the trichomes usually gland-tipped; but Airy Shaw, Kew Bull. 306. 1940, found the leaf shapes (ovate or obovate), pedicels (bibracteolate or bractlets scattered), and corollas (campanulate or urceolate) the diagnostic characters.

Flowers solitary; leaves rarely 1.5 cm. long, or often about as wide as long.
  Pedicels tomentose; basal bractlets 4–5 . . . . *G. secunda.*
  Pedicels hispid; basal bractlets binate . . . . *G. congesta.*
Flowers several in racemes; leaves often longer than 2 cm. and longer than wide.
  Indument floccose-tomentose, sometimes deciduous from the leaves.
    Leaves lanceolate-oblong, to about 12 mm. wide . . *G. tomentosa.*
    Leaves broadly elliptic, about 4 cm. wide . . . . *G. Remeyana.*
  Indument never floccose-tomentose, sometimes nearly lacking.
    Racemes all or mostly apically crowded and nearly or quite glabrous even to the flowers . . . . *G. Jelskii, G. glabra.*
    Racemes all or mostly upper axillary but more or less pubescent.
      Leaves, at least most of them, shorter than 4 cm., few if any longer.
        Indument of racemes eglandular (typically; character of expediency).
          Low, often subdecumbent; racemes short, rarely longer than leaves; corolla glabrate.
          G. tristis, G. loxensis, G. brachybotrys.
          Erect or clambering; racemes often longer than leaves; corolla densely pubescent . . . . *G. bracteata.*
        Indument of racemes more or less glandular.

Decumbent shrub; leaves mostly subcordate.
G. apiculata.

Erect shrub; leaves not at all cordate.
G. Jelskii, G. Weberbaueriana.

Leaves mostly or all longer than 4 cm.

Indument eglandular.

Indument, at least predominately, more or less spreading.

Corollas appressed pubescent; racemes usually soon as long or longer than subtending leaves.

Leaves dull and glabrous above .... *G. opaca.*

Leaves somewhat lustrous, glabrate above in age.
G. loxensis, G. bracteata.

Corollas glabrous; racemes shorter than leaves.
G. glomerata.

Indument obviously appressed, strigose, sparse.
G. insipida.

Indument, at least on racemes, in part somewhat glandular, the branchlets sometimes glutinous.

Leaves lightly scabrous above; racemes as corollas glandular .... *G. glandulosissima.*

Leaves glabrous or nearly above; racemes somewhat glandular unless corollas.
G. Jelskii, G. odorata, G. erecta.

Gaultheria apiculata Sleumer, Notizbl. Bot. Gart. Berlin 12: 59. 1934.

Small decumbent shrub, the younger branchlets more or less densely pubescent with rusty trichomes 1–1.5 mm. long, the petioles, these 2 mm. long, and leaves beneath laxly reddish strigose, the latter slightly so above, chartaceous, minutely denticulate to nearly entire, apiculate, mostly subcordate at base, 19–23 mm. long, 10–17 mm. wide, with usually 2 nearly basal lateral nerves (sometimes a third above the base) little if at all impressed above, the veins obscurely if at all obvious either side; inflorescences 3 or 4 in the upper leaf-axils, 4–7-flowered, reddish glandular even to the corollas, the rachises 2–2.5 cm. long, the pedicels and calyces also white puberulent, 3–5 mm. long and 3 mm. long, the basal bracts membranous, ovate-elliptic, glandular-ciliate, 5 mm. long, 2 mm. wide; corolla roseate, 5–6 mm. long, 4 mm. wide, the glandular trichomes nearly 1 mm. long, pilose within as the filaments; ovary subglabrous; style nearly 3 mm. long, pilose at base, 5-lobed; capsule puberulent and glandular, 5–6 mm. thick, crowned by the appressed fleshy calyx lobes.

Junín: West of Huacapistana, 3,100 meters, (*Weberbauer*, type).

Gaultheria brachybotrys DC. Prodr. 7: 595. 1839.

Branchlets minutely strigillose and densely reddish-brown (or in age black), setose; leaves ovate-elliptic or oblong, obtuse or subacute at base, more or less acuminate, glabrous or (in type) minutely or obscurely puberulent above, somewhat reddish or black hispidulous beneath and on the entire margins, in type about 4 cm. long, 1.5–2 cm. wide; racemes axillary, half as long as the leaves, 7–9-flowered; bracts oval-oblong-lanceolate, glabrous dorsally as the ovate-lanceolate, about 3 mm. long calyx lobes, but the younger ciliate marginally; corolla ovate, puberulent without.—After DeCandolle. The following collections have branchlets brown villous-setose; bracts 6 mm. long; leaves emarginate or rounded at base, glabrate above, 3.5 by 2.5 cm. or wider, or 3 by 1.5 cm. Seemingly should be included in *G. glomerata*. F.M. Neg. 29338.

Cajamarca: Nanchó, *Raimondi* (det. Smith).—Amazonas: Chachapoyas, *Mathews*, type.—La Libertad: Huamachuco, prostrate or trailing from rock crevices, 2 dm. to 1.5 meters long, 3,300 meters, *West 8098* (det. Johnston); erect, dense, in gulch, *West 8099* (det. Johnston). Cachicaden, dry, shrubby hillside, 3 dm. high, flowers roseate, *Stork & Horton 9963* (det. Standley).—Huánuco: In fog belt, flowers waxy white, 2,800 meters, *Stork & Horton 9909* (det. Standley). Muña to Pozuzo, *Raimondi* (det. Smith). Tambo de Vaca, *4449* in part. Mito, *1931; 3369*. Sariapampa, *Woytkowski 34312* (det. Smith).—Junín: Huassahuassi, *Ruiz & Pavón; Dombey*. Cerro de Pasco, *Sawada 91*.—Apurímac: Half trailing bush 1–5 dm. high, pink flowers, 3,500 meters near pass to Pacachacas, *West 3779* (det. Johnston).—Cuzco: Valle del Urubamba, *Herrera 3414; 3435; 3439* (det. Standley). Paucartambo, *Herrera 2311*. Pillahuata, *Vargas 7070*. Yucay, *Soukup*. Cerro de Cusilluyoc, *Pennell 13903* (det. Smith).—Puno: Sandía, *Metcalf 50450* (det. Leonard). "Ruunccoto" (Herrera).

Gaultheria bracteata (Cav.) G. Don, Gen. Syst. 3: 840. 1834. *Andromeda bracteata* Cav. Icones 6: 42, *pl. 562.* 1801. *G. rufescens* DC. Prodr. 7: 595. 1939, fide Sleumer. *G. bicolor* Sleumer, Notizbl. Bot. Gart. Berlin 12: 59. 1934, fide author.

Erect or sometimes clambering, the bark of older branches exfoliating, the younger terete branchlets rusty pubescent only at the tip; petioles stout, more or less pilose, 4–6 mm. long; leaves oblong-elliptic, somewhat attenuate at base, acuminate—the gland-tipped acumen to 1 cm. long—regularly denticulate, 5.5–7.5 cm. long, 2–2.7 cm. wide or somewhat smaller, subcoriaceous, short-appressed pubescent especially beneath, the faces in age rather glabrescent, the upper one lustrous; midnerve and the 3–4 lateral nerves obviously impressed above, beneath prominent and rusty pilose, the reticulate veins moderate; racemes 3–4 together near the branchlet-tips, 7–12-flowered, 4–6.5 cm. long, the rachises and pedicels (these to 1.5 cm. long) brown-tomentose-villous, the many often roseate bracts elliptic-oblong, 8 (–12) mm. long, 3 (–4) mm. wide, glabrous except the white-ciliate margins; calyx 2.5 (–3) mm. long, laxly rusty pilose only above; corolla densely (in type) long-pilose without, eglandular, subglabrous within, 5 mm. long, half as thick at base, the 5 short lobes obtuse; filaments 10 or 8, laxly pilose, the anthers acutely corniculate; ovary at tip sparsely yellowish-pilose, the stout style glabrous above, nearly 3 mm. long.—Description mostly after Sleumer (*G. bicolor*, type 2 meters high). Type of species from Ecuador by Née. F.M. Neg. 26621.

Cajamarca: Nanchó, *Raimondi* (det. Smith). Conchau, Prov. Chota, *Stork & Horton 10076*.—Huánuco: Near Monzón, in scattered shrubs, moor or grass steppes, (*Weberbauer 3370*). Tambo de Vaca, *4438*. Pampayacu, *Sawada 20; Kanehira 1; 6*. Palca, *Dombey* (*G. rufescens*). Panao, *2210*. Southwest of Huánuco, *2117*. Pillao, *Woytkowski 34035; 34061* (both det. Smith). West of Carpish, *Stork & Horton 9889*.—Junín: Huassahuassi, *Ruíz & Pavón*. Huacapistana, *Killip & Smith 24212; Sandeman 4376* (det. Standley). Tarma Prov., Agua Dulce, *Woytkowski 35471* (det. Smith).—Cuzco: Pillahuata, *Pennell 13914; 14094*. Acanacu, *Vargas 309*.—Puno: Sachapata, *Raimondi* (det. Smith, *G. rufescens*). Ecuador. "Rhinnin cussau" (Ruíz & Pavón, for several species).

Gaultheria congesta Fedstch. & Basil. Notul. Syst. Herb. Hort. Bot. U.S.S.R. 6, pt. 2: 21. 1926.

Branches terete, glabrous, or minutely pilose, the branchlets early ferrugineous hispid becoming densely gray hirsute; petioles to 1 mm. long, sulcate and hirtellous above; leaves ovate, rounded at base, mucronately acute, 7–8 mm. long, 3–4 mm. wide, recurving ciliate margins serrulate, lustrous and reticulate, the veins tomentulose above, beneath strigose; flowers axillary, solitary but crowded apically, the pendulous pedicels hispid; basal bractlets binate, ovate-rotund, obtuse, ciliate; calyx pilose within, the 5 lobes acuminate; corolla urceolate, 5 mm. long or about twice as long as the calyx, glabrous without, pilose within, the 5 triangular teeth acute; stamens about 2.5 mm. long, filaments basally connate, scarcely ciliate, the anthers shortly cornute; ovary pubescent.—Allied to *G. conferta* Benth. but differing in pubescence of branches and flowers and in form of calyx which is much shorter (authors); could conceivably be a part of *G. secunda.*

Amazonas: Andemarca, (*Mathews 1173*, type).

Gaultheria erecta Vent. Hort. Cels. *pl. 5.* 1800.

More or less glutinous and glandular or the branchlets glabrate in age; leaves subdenticulate or entire, oblong-elliptic, rounded to subcordate at base, abruptly acute or apiculate, glabrous or nearly above, more or less rusty scabrous pubescent beneath, especially on nerves, ordinarily to about 5 cm. long, 2 cm. wide, sometimes smaller, sometimes larger; racemes few in the upper axils, about 6 cm. long (in type longer), more or less finely pubescent-villous, obscurely to sometimes abundantly glandular, especially the pedicels and rachis; bracts ciliate, to about 1 cm. long or as long as the spreading or recurving pedicels; calyx usually glandular, about 5 mm. long, the corolla more or less pilose or glabrate or subglabrous, 6–7 mm. long, in type twice as long as calyx; anthers aristate.—Type, without data, Herb. Delessert, Geneva. F.M. Neg. 28925.

Amazonas: Chachapoyas, *Williams 7560* (det. Smith).—San Martín: Zepelacio, *Klug 3278* (det. Standley). Near Tarapoto, *Spruce 4395.*—Huánuco: Carpish Pass, *Allard 21083; Stork & Horton 9889.* Villcabamba, *4997* (det. Smith). Pan de Azucar, *Sawada 70.* Chinchao, *Raimondi* (det. Smith).—Junín: Vitoc and Chanchamayo, *Martinet.*—Huancavelica: Near Surcubamba, Prov. Tuyacaju, *Stork & Horton 10340* (less glandular).—Ayacucho: Ccarrapa, *Killip & Smith 22340.* Choimacota Valley, *Weberbauer 7543.*—Cuzco: Upper valley of Rio Sambay, *Mexia 8057.* Above Pillahuata, *West 7070; Pennell 13961; 14081.* Río Chaupinmayo, *Soukup 583.* Marcapata, *Vargas 9705.* Marachea, *Vargas 11126.*—Puno: Sandía, *Soukup 228.* Rocky slopes of Limbani, *Vargas 9646; Metcalf 30507.* "Pachyla-pachyla" (Stork & Horton).

Gaultheria glabra DC. Prodr. 7: 596. 1839.

Essentially glabrous except the racemes, the glabrous white corolla puberulent within and the ovary densely silky villous; leaves elliptic, the base subacute, the tip produced into a glanduliferous mucro, closely crenate or perhaps serrate-dentate, reticulate-veined both sides, black punctate beneath, to about 3.5 cm. long, 18 mm. wide; racemes exceeding the leaves, crowded at the tips of the angled branchlets, the angulate rachises and pedicels somewhat puberulent-setulose; bracts oblong-lanceolate, scarcely ciliolate, the bractlets at base of pedicels linear; calyx lobes acuminate.—In the following collections other than type, the leaves vary between 2–4 cm. long, 1–2 cm. wide. Determinations mostly by Smith. Sometimes tree-like; 3 meters high. F.M. Negs. 8627; 31956.

Cajamarca: Near Socota, 3,200 meters, neat shrub to 1.5 meters, *Stork & Horton 10126* (det. Standley). Chota, *Raimondi.*—Amazonas: *Mathews,* type.—Huánuco: Panao, *2220.* Acomayo, *Woytkowski 34256.* Pampayacu, *Sawada 26.* Mito, *1389; 1673.*—Junín: Huacapistana, *Killip & Smith 24245.* Carpapata, *Killip & Smith 24432.* Chanchamayo, *Raimondi.*—Huancavelica: Salcabamba, open shrub land, two-meter shrub, flowers white, *Stork & Horton 10300* (det. Standley). Surcubamba, *Stork & Horton 10365* (det. Standley).—Ayacucho: Ccarrapa, *Killip & Smith 22291.* Prov. Huanta, *Weberbauer 5577; 7549; Raimondi.*—Cuzco: Near Acanacu, 2,800 meters, shrub to 3.5 meters, *West 7087* (det. Johnston). At summit, Huana Picchu, *West 6433* (det. Johnston). Marcapata, *Weberbauer 7851.* Urubamba Valley, *Bolls 6800; Mexia 8075.* Pillahuata, *Pennell 13920.*—Puno: Near Guiaca, *Raimondi* (det. Leonard). Sandía, *Metcalf 30596.* Near Limbani, *Metcalf 30538.* "Mullacus."

Gaultheria glandulosissima Sleumer, Notizbl. Bot. Gart. Berlin 12: 60. 1934.

Branchlets laxly brown-villous (the tips glandular), tardily glabrate; petioles about 2 mm. long; leaves ovate-oblong, rounded at base, rarely subcordate, shortly acuminate, regularly denticulate (teeth often gland-tipped), 4.5–5.5 cm. long, 2–2.5 cm. wide, more or less setose-hirsute and rugose above, early densely long-rusty-strigose beneath, at maturity somewhat tomentose-hirsutulous; lateral nerves 3–4, prominent only beneath, the veins scarcely obvious; racemes lateral or terminal, 7–9-flowered, 5–6 cm. long, long-pilose-glandular even to the obtuse calyx lobes and the corollas without, the former 3.5 mm. long, glabrous within, the latter nearly so, 7 mm. long, 4 mm. thick at base, the obtuse lobes only 1.2 mm. long; filaments shortly pilose, the anthers 4-tubulate; ovary white pilose, the entire glabrous style 3.5 mm. long.—Small shrub about half a meter high with purple flowers, the pedicels to 6 mm. long, the basal bracts densely glandular only on the margins. Has little to recommend it as a species. F.M. Neg. 28926.

Junín: Mountains west of Huacapistana, 2,000 meters, (*Weberbauer 2143*, type).

Gaultheria glomerata (Cav.) Sleumer, Notizbl. Bot. Gart. Berlin 12: 283.1935. *Andromeda glomerata* Cav. Icones 6: 42. 1801. *Agarista? anastomosans* G. Don, Gen. Syst. 3: 838. 1834. *G. pichinchensis* Benth. Pl. Hartw. 225. 1846. *G. petraea* Wedd. Chlor. And. 2: 174. 1857.

Similar in leaves and pubescence to *G. bracteata;* flowers in axillary racemes so short as to appear glomerate; bracts ovate, acute, glabrous, longer than the bibracteolate peduncles; corolla glabrous, tubular-ovate, pale rose; otherwise as in the related species (after Cavenilles).—Synonymy after Sleumer, who suggests that a scrap in herbarium Delessert labeled *G. bracteata* may rather be this, an error in labeling, since Smith, Bull. Torrey Club 60: 103. 1933, notes that this scrap matches *G. pichinchensis*. F.M. Neg. 29339.

Huánuco: Monzón, *Weberbauer 3377* (det. A. C. Smith, l.c., *G. bracteata*, presumably the same as Sleumer's specimen cited by him as "3370"). Ecuador.

Gaultheria insipida Benth. Pl. Hartw. 225. 1846.

Branchlets, petioles (2–3 mm. long), and leaf-nerves beneath more or less strigose with mostly appressed rather rigid trichomes; leaves ovate, rounded at base, narrowly shortly or subabruptly acuminate to nearly 1 dm. long, about 4 cm. wide or mostly smaller, glabrate above, the nerves impressed, sparsely hispid beneath, especially on the prominent nerves and reticulate veins; racemes rather densely appressed strigose, often shorter than the leaves; bracts ovate, shorter than pedicels, these to 5 mm. long, persisting; calyx segments subulate-acuminate and corolla glabrous in type, 5 mm. long; anthers very shortly bimucronulate.—After Bentham; the Peruvian shrub, openly branched, is in fruit and young flowers, possibly distinct, and may be designated now var. **peruviana** Macbr., var. nov., foliis plerumque 4–5 cm. longis, 2.5–3 cm. latis; corolla sparse strigosa. The one developed flower is in a packet specimen by Kanehira. Someone has suggested on the sheet that this is a new species related to *G. strigosa* Benth. which it also resembles in indument, but the leaves of that species are much smaller. F. M. Neg. 26626.

Huánuco: Villcabamba, Río Chinchao, *5202* (type, var.). Pampayacu, *Kanehira* 24. Tambo de Vaca, *4449* (in part)? Ecuador.

Gaultheria Jelskii Szyszyl. Dissert. Classis Math.-Phys. Acad. Litt. Cracov. 29: 229. 1895; 19.

Branchlets slender, early minutely pilose; petioles 2–3 mm. long, leaves oblong-lanceolate, 2–2.5 cm. long, 1–1.5 cm. wide, obtuse at base, the glandular serrate margins scarcely revolute, otherwise glabrous, coriaceous, lustrous and paler above, punctate, the nerve rather prominent both sides; racemes axillary, pubescent with some glandular trichomes intermixed, 4–18-flowered, 4–6 cm. long, bracts ovate, 2–3 mm. long, glabrate, ciliate; pedicels 8–10 mm. long, the nearly basal bractlets membranous, ciliate-glandular, the larger bractlets narrowly lanceolate, 4–5 mm. long, the smaller cuneate-lanceolate; calyx glabrous, the 5 ovate-acuminate lobes 3–4 mm. long; corolla ovate-urceolate, pilose within, 6–7 mm. long with 10-dentate annulus; stamens equal, included, the anthers dehiscing by an oblique subrotund pore, biaristate, the filaments pubescent; ovary densely canescent; capsule 3 or 4 mm. thick, the seeds 0.5 mm. long.—Approximate to *G. glabra* DC. (Ignacio Szyszylowicz), or could be a part of *G. erecta* (*G. odorata*).

Cajamarca: Cutervo, *Jelskii 262* (type).

Gaultheria loxensis Benth. Pl. Hartw. 143. 1844.

Branchlets minutely puberulent, petioles short, leaves ovate or oval-oblong, deeply cordate at base, rigid-coriaceous, serrulate, glabrous or minutely puberulent; racemes in type longer than leaves, the rachis or pedicels sparsely setose-puberulent; bracts broad; corolla sparsely hispid.—After Bentham.

Cajamarca: Ayavaca, *Raimondi* (det. Smith).—Amazonas: Chachapoyas, *Raimondi* (det. Smith). Ecuador.

Gaultheria odorata HBK. Nov. Gen. & Sp. 3: 285. 1819. *G. cordifolia* HBK. l.c. 285, at least as to Peru.

Branchlets and racemes viscidly glandular-hispidulous; petioles 2–4 mm. long; leaves ovate or ovate-oblong, emarginate-rounded at base, slightly acuminate, 2.5–5 cm. long, 14–24 mm. wide, rigid, typically coarsely denticulate, more or less obsoletely immersed-reticulate even on the glabrous lustrous upper surface, punctate-scabrous beneath; racemes longer than the leaves, 5–10 cm. long, erect, lax; pedicels 8–10 mm. long; bracts oblong, obtuse, 6–10 mm. long, membranous, reddish, glabrous but ciliolate, basal or above the base; calyx and corolla typically glandular-pilose, the former 3 (–5 in fruit) mm. long.—In the variant *leiocalyx* Meissn. the leaves are subentire, densely glandular-ciliate and somewhat scabrous above, the pedicels bracteolate at base, the calyx glabrous except for the broadly ovate obtusish glandular-ciliolate lobes. To this was referred by Meissner *Spruce 4395* from Tarapoto, here cited under *G. erecta;* the species in any case seem to be variants of one entity; or *G. odorata* is properly restricted to Venezuela, Mexico and Central America. F.M. Neg. 4754.

Peru (cf. note above). To Venezuela and Mexico. "Pejoa."

Gaultheria opaca Sleumer, Notizbl. Bot. Gart. Berlin 12: 61. 1934.

Branches spreading, the older glabrate, the younger moderately puberulent; petioles 2–3 mm. long; leaves ovate- or oblong-elliptic, rounded-truncate at base, shortly cuspidate-acuminate, very closely and regularly denticulate, 4.5–6 cm. long, 2–2.5 cm. wide, broadest at the middle, chartaceous or subcoriaceous, smooth and glabrous above, evenly but deciduously asperous beneath, dull both sides, the midnerve and 3 or 4 lateral nerves rather prominent only beneath, the veins there obvious but little reticulate; racemes solitary in the uppermost axils, 8–15-secund-flowered, 5–7 cm. long, the rachises and pedicels 4–5 mm. long, rusty villous; bracts membranous, short-ciliate, otherwise glabrous as the bractlets; calyx lobes acute, 1.5 mm. long, only ciliate; corolla distinctly narrowed at the short lobes, more or less densely long-pilose without, loosely so within below; filaments pilose, the anthers 4-corniculate; ovary globose, densely tomentose, the entire style 2.8 mm. long.—Flowers purple, the type a meter high; racemes more pubescent than in the habitally similar *G. alnifolia* (Don) A. C. Sm. of Venezuela (Sleumer). Seems to be too near *G. bracteata.*

Huánuco: Mountain southeast of Monzón, in evergreens, 1,600 meters, (*Weberbauer 3519,* type). Río Pozuzo, *Weberbauer 6756.*—Cuzco: Marcapata Valley, *Weberbauer 7838.*

Gaultheria Remyana A. C. Sm. Contr. U. S. Nat. Herb. 29: 347. 1950. *G. mucronata* Remy, Ann. Sci. Nat. sér. 3. 8: 232. 1847, not Hook. & Arn., 1834.

Branches densely ferrugineous-tomentose; leaves oblong-elliptic, sometimes obovate-elliptic, adult often narrowed at base, obtuse, mucronate, 6–9 cm. long, 2.5–4.5 cm. wide (petioles 4–6 mm. long), coriaceous, early softly fulvous tomentose above, densely ferrugineous-tomentose beneath, finally glabrate, the nerves reticulate; flowers in terminal divided racemes, the glabrate pedicels 3-bracted at base; calyx segments acute, lanate; corolla tomentose, capsules pubescent.—After Remy. F.M. Neg. 38262.

Puno: Near Pajonal, *Metcalf 30625* (det. Smith). Aconeque, *Metcalf 30568* (det. Smith). Tabina, *Lechler 1890.* Bolivia.

Gaultheria secunda Remy, Ann. Sci. Nat. sér. 3, 8: 231. 1847. *G. vaccinioides* Wedd. Chloris And. 2: 176. 1857? *G. buxifolia* Willd. Ges. Naturf. Fr. Neue Schr. 3: 422. 1801?

Procumbent, slender, the stems branched, elongate, often hirsute; petioles 3 mm. long; leaves evidently secund, oval, obtuse, mucronate or subacute, rounded at base, serrulate, scarcely pubescent above, finally glabrescent, usually laxly sericeous-ferrugineous beneath, 2.5 cm. long or shorter, 6–12 mm. wide, flowers on solitary axillary pedicels 6–8 mm. long, ferrugineous tomentose, arcuate, with 4–5 basal bractlets, or these above the base (*G. vaccinioides*); calyx glabrous, the obtuse lobes ciliate, corolla 5 mm. long, glabrous as stamens; capsule pubescent (Remy).—Type from Bolivia; according to Smith the branchlets and pedicels are white puberulent as well as strigose with stiff trichomes, anthers obscurely awned, ovary copiously puberulent. No description applies to all of Peruvian specimens so named even by Smith, many suggesting the plant of Weddell which ex char. differs in stems erect or ascending, branchlets sparsely setose-pilose, leaves ovate or elliptic, acute, 10–12 mm. long, glabrous, reticulate beneath, pedicels 4 mm. long, bracted above the base (perhaps important), calyx lobes acuminate, corolla 4–5 mm. long, glabrous, the filaments minutely puberulent. Weddell distinguished his plant from *G. anastomosans* (L. f.) HBK. of Colombia by the glabrous corolla and puberulent instead of pilose filaments, but a scrap of the HBK. specimen suggests that the differences may not be important. Collections as cited vary in leaf-shape from oblong-lanceolate to broadly elliptic, glabrous to pubescent, the inflorescences sometimes canescent puberulent or setose-villous and not at all or somewhat puberulent; there are thus several local species or variants, or one variable one, a problem for a student; it is noteworthy that Sleumer has referred a Ruíz and Pavón specimen to *G. buxifolia* Willd., of Venezuela, while Smith regards part at least of the Peruvian specimens as belonging to *G. secunda* of Bolivia. The Ruíz and Pavón "*G. buxifolia*," fide Sleumer, of Pillao has strigose branchlets, revolute leaves, glabrous beneath, serrulate, about 1.5 cm. long, 1 cm. wide, pedicels glandular-hirsute, bracted at base. F. M. Neg. 28928 (*G. vaccinioides*).

Huánuco: Playapampa in sphagnum, *4526; 4528.* Tambo de Vaca, *4411; 4447.* Pampayacu, *Kanehira 180.* Sariapampa, *Woytkowski 34308; 34315; 34316* (all det. Smith). Pillao, *Ruíz & Pavón* (det. Sleumer, *G. buxifolia*).—Huancavelica: Montepungo, east of Surcubamba, in fog zone, 3,000 meters, calyx scarlet, corolla red, *Stork & Horton 10381.*—Ayacucho: Prov. Huanta, *Weberbauer 5657; 7521; 7526.*—Cuzco: Prov. Paucartambo, *West 7031A; 7058; 7065; 7080.* Prov. Urubamba, *Metcalf 30736.* Cerro de Cusilluyoc, *Pennell 13822; 13960.*—Puno: Ayapata, *Lechler 1950* (type, *G. vaccinioides*). Bolivia.

Gaultheria tomentosa HBK. Nov. Gen. & Sp. 3: 287. 1819.

Unique, at least in Peru, by the combination of narrowly lanceolate-oblong leaves and more or less rusty tomentose indument, this especially abundant toward the growing tips, including the flowers; leaves obtuse at base, acute, entire, 3 cm. long or longer, 8–12 mm. wide, faintly or scarcely reticulate-veined, coriaceous, lustrous and glabrous above in age; racemes to several cm. long, axillary and terminal; pedicels 3–6 mm. long, the ovate-oblong basal bracts much shorter, the 2 bractlets above the base linear; calyx subglobose, the ovate lobes acute; corolla ovoid, 4 mm. long, the lobes obtuse; stamens included, filaments pilose; ovary rusty tomentose, style glabrous.—Raimondi collections determined by Smith. Type from Ecuador.

Cajamarca: Cutervo, *Jelski 361* (det. Szyszylowicz); *Raimondi.*—Amazonas: Chachapoyas, *Raimondi.*—Huánuco: *Raimondi.*—Junín: Tarma, *Weberbauer 2077.*—Huancavelica: Surcubamba, 3,000 meters, *Goodspeed Exped.* (det. Standley). Ecuador.

Gaultheria tristis Sleumer, Notizbl. Bot. Gart. Berlin 12: 129. 1934.

Decumbent, the black branchlets more or less dark setose toward the tips, petioles stout, scarcely 2 mm. long; leaves ovate-oblong, mostly rounded or slightly cordate at base, gradually acuminate, serrate-dentate (the thick teeth tipped with a black bristle), usually broadest at middle and 2–3 cm. long, 15–18 mm. wide, rigid-coriaceous, glabrous except the midnerve and the 3 or 4 lateral nerves beneath, these with the reticulate veins prominent only there and sparsely setulose; racemes 3–5, apically crowded, 8–11-flowered, 2–4 cm. long, grayish puberulent except the oblong bracts, these 7 mm. long, about 2 mm. wide; pedicels 5–7 mm. long, sometimes a little setulose; calyx lobes acutish, 5 or 6 mm. long; corolla 6 or 7 mm. long, 4–5 mm. thick, glabrate without, puberulent within, the lobes subacute; filaments nearly glabrous, ovary subglobose, densely short pubescent, the style 3 mm. long, laxly pilose below, nearly entire.—Habit of *G. megalodonta* A. C. Sm. and *G. reticulata* HBK., but is readily separated by the strong nervation of the leathery leaves beneath (Sleumer). This difference "sounds" ecological; cf. *G. brachybotrys*, at one time referred to *G. reticulata* by Smith. Besides the type there are several collections made by Raimondi from the same region.

Cajamarca: Huambo, Chota, Cutervo, *Raimondi*.—Amazonas: Between Tambo Ventilla and Bagazán, 3,300 meters, (*Stübel 25d*, type). Chachapoyas, *Raimondi*.—Junín: Punto de Andamarca, *Raimondi*.

Gaultheria Weberbaueriana Sleumer, Notizbl. Bot. Gart. Berlin 12: 64. 1934.

Younger branchlets rusty-gray pubescent and more or less glandular; petioles 5–6 mm. long; leaves long-ovate-oblong or long-elliptic, broadly rounded (not at all cordate) at base, gradually acuminate, broadest at lower third, regularly but minutely serrate-dentate, 3.5–4 cm. long, 10–14 (20) mm. wide, glabrous above, evenly but rather sparsely dark-pubescent beneath or at least finally ornate with dark vernicose exudations; midnerve strongly impressed above, the 3–4 laterals little so but obviously beneath, the reticulate veins indistinct; racemes usually 3 or 4 crowded near branchlet tips, 10–15-flowered, 3–5 cm. long, densely white puberulent-pilose and glandular including the bracts (7–9 mm. by 2–2.5 mm.), pedicels (about 4 mm. long), and acute calyx lobes, these also ciliolate, 3 mm. long; corolla pilose only at base, rusty strigose but eglandular (or sparsely) above, 5 mm. long, nearly 3 mm. thick, the lobes obtuse; filaments densely villous; ovary depressed globose, pilose, the style glabrous above, about 4 mm. long.—Flowers rose-colored, the type 2 meters.

Huánuco: Southwest of Monzón in evergreens, 2,500 meters, (*Weberbauer 3402*, type). Mito, *1388; 1625*. "Pango mullaca."

23. LEUCOTHOE D. Don

Essentially smooth shrubs with terete branches, alternate usually evergreen leaves and terminal or subterminal racemes that thus form a panicle of white-bracted and bracteolate urceolate or cylindric 5-dentate flowers. Calyx of 5 free persisting sepals. Stamens 10, the oblong anthers obtuse and dorsally awnless but each cell awned or bimucronulate. Ovary 5-celled, the somewhat depressed capsule loculicidal.—The Peruvian species belong to section *Agastia* DC., the anthers with broad obliquely cleft awned tubules, style clavately enlarged above the middle, the stigma truncate; cf. Sleumer, Notizbl. Bot. Gart. Berlin 13: 212. 1936. The name was that of the daughter of the king of Babylon.

The foliage, at least of some species, is extremely poisonous to sheep and, presumably, to any stock.

Leaves subcordate to rounded at base, to 2 cm. long. *L. bracamorensis.*

Leaves broadly cuneate or subrounded at base, mostly 3 cm. long or longer.. *L. andina.*

Leucothoe andina Sleumer, Notizbl. Bot. Gart. Berlin 12: 478. 1935.

Branchlets densely leafy, the younger pubescent as also the petioles, these about 5 mm. long; leaves oblong, commonly gradually acuminate (sometimes glandular-mucronulate), broadly cuneate or rarely subrounded at base, rigidly chartaceous, entire, 4–5 (6) cm. long, usually 1.5–2 cm. wide, obviously reticulate-veined beneath; racemes to 8 cm. long, the rachis densely puberulent, the pedicels at anthesis 5–7 mm. long with subulate bracts near and at base; calyx lobes especially without puberulence, 1.5 mm. long; corolla white, tubular with very short lobes, little ventricose basally, glabrous, 6–7 mm. long; stamens 10, the slightly pilose filaments sigmoid apically, the ovate-oblong anthers awned; ovary subglobose, densely white puberulent pilose; capsule 4 mm. thick.—A 2-meter shrub that differs from *L. multiflora* (Pohl) DC. in the puberulent fruit, and from *L. ambigua* Meissn. in the smaller flowers, both Brazilian species. *L. colombiana* Sleumer, l.c. 479, and *Gaylussacia subcordata* (*L. bracamorensis* (HBK.) Dunal), the former more northern as to type, may prove to be variants, as Sleumer suggests. His other species has greenish corollas, ventricose at base, the lobes 1.3 mm. long. *L. Duckei* Huber, Bull. Soc. Bot. Genève, sér. 2. 1: 246. 1909, of Brazil has tomentulose branchlets, leaves 2.5–5 cm. long, 1–2 cm. wide, acute at base, mucronate, the veins immersed both sides; judging from the drawing the calyx is thickly tomentose; however, it is rather puberulent and the leaf veins may be reticulate in some stages, so the species may be found to vary in these respects.

Cajamarca: Cutervo, (*Jelski* in herb., *Raimondi 6360*).—Amazonas: Pipos, east of Chachapoyas, 2,000 meters, (*Weberbauer 4362*, type).

Leucothoe bracamorensis (HBK.) Dunal in DC. Prodr. 7: 603. 1839. *Andromeda bracamorensis* HBK. Nov. Gen. & Sp. 3: 288. 1819. *Gaylussacia subcordata* Dunal in DC. Prodr. l.c. 557.

Glabrous or the younger parts slightly puberulent; branchlets angled, densely leafy; petioles of older leaves to 4 mm. long; leaves elliptic- or ovate-oblong, rounded to slightly cordate at base, more or less mucronate at the rounded tip, 12–20 mm. long, 5–10 mm. wide, early veinless, the older somewhat reticulate-veined beneath, becoming green beneath as above where drying lustrous, coriaceous; racemes in the upper axils, 5–6 cm. long; bracts minute; pedicels about 4 mm. long; calyx lobes ovate, cuspidate; corolla red, ventricose, about 6 mm. long, with ovate obtuse revolute teeth; filaments ciliate, anthers awned, capsules globose, seeds linear-subulate.—The Chachapoyas plants have a slight puberulence on the branchlet tips; apparently the species should include the shrub of Sleumer, *L. andina*. F.M. Negs. 38218; 26638 (*G. subcordata*).

Cajamarca: Prov. Bracamoros, near San Felipe and Parano de Yamoca, *Bonpland*, type.—Amazonas: Chachapoyas, *Mathews* (type, *G. subcordata*); *Williams 7549*.

PRIMULACEAE Vent. Primula Family

Reference: Pax & Knuth, Pflanzenreich IV. 237. 1905.

Annual or perennial herbs, rarely somewhat ligneous, with exstipulate, alternate, opposite or verticillate, entire or lobed leaves and racemose, spicate, paniculate or apically subumbellate flowers or these sometimes solitary, axillary, usually actinomorphous, most frequently dimorphous, heterostylous, 5 (4–7) -merous. Calyx more or less persisting, often somewhat foliaceous. Corolla tube short or long, the lobes imbricate or contorted. Stamens epipetalous but sometimes alternate with staminodia. Ovary superior or semi-inferior, 1-celled with central placentae, the ovules many. Fruit a capsule variously dehiscing, the seeds angulate or angulate compressed, with abundant endosperm.

Primula and Cyclamen, the well-known members of this family, are grown for their ornamental value, the species developed in horticulture of European origin. The cultivated species of the former have been treated recently by Walter C. Blasdale, University of California Press.

Corolla lobes contorted; ovary superior.
  Capsule dehiscence operculate; anthers 4–5, ellipsoid; flowers axillary.
    Corolla usually larger than calyx; leaves opposite (Peru). 1. *Anagallis.*
    Corolla smaller than calyx; leaves alternate....2. *Centunculus.*
  Capsule dehiscence valvate; anthers 5–6, oblong; flowers rarely axillary....................................3. *Lysimachia.*
Corolla lobes imbricate; ovary partly inferior.........4. *Samolus.*

1. ANAGALLIS [Tourn.] L.

More or less decumbent or semierect herbs with usually alternate or opposite sessile or subsessile leaves and small usually long-pedicelled flowers rarely disposed in a lax raceme. Calyx deeply 5-parted as the corolla, the latter rotate-campanulate, the contorted lobes entire or erose-dentate. Stamens 5, affixed to the base of the corolla, rarely glabrous. Capsule circumscissile, with many small seeds.

Anagallis arvensis L. Sp. Pl. 148. 1753; 322.

Glabrous annual, the procumbent or ascending to suberect quadrate stems sometimes a dm. or two long and more or less branching; leaves opposite or ternate, sessile, ovate-oblong, subacute, about 10 mm. long, 3 or 4 mm. wide; pedicels 1 or 2 times longer than the leaves, recurving in fruit; calyx segments subulate, narrowly and acutely acuminate, about 3.5 mm. long; corolla lobes obovate, serrulate; filaments ciliolate and at very base connate; shorter anthers cordate at base.—Corolla lobes reddish and more or less glandular in the var. *phoenicea* (Scop.) Gren. & Godr., blue (forma *azurea* Hyl.) and eglandular in the var. *coerulea* (Schreb.) Gren. & Godr., this by some regarded as a species. Other species possibly to be expected include *A. filiformis* C. & S. with filiform stems, rounded ovate leaves 7 mm. long, filaments one-third to one-fourth connate, and *A. pumila* Sw., the leaves alternate except the lower.

Lima: Matucana, *317*. Miraflores, *Vargas 1237*.—Huánuco: Near Huánuco in sandy loam, *Stork & Horton 9370*. Cornfield, Mito, *1533*. Acomayo, *Woytkowski 34232*.—Apurímac: Along highway, Prov. Abancay, *Vargas 1266; 9615*. Nearly cosmopolitan.

2. **CENTUNCULUS** [Dill.] L.

Small herb much like *Anagallis* but the flowers often 4-merous and the stamens affixed to the throat of the corolla.

Centunculus minimus L. Sp. Pl. 116. 1753; 335.

Prostrate-erect, often delicate, sometimes much branched, rarely a dm. long, the many sessile alternate ovate mucronate leaves 2–5 mm. long; calyx lobes about 1 mm. longer than the corolla, this urceolate-rotate with lanceolate acuminate lobes; capsule membranous with many minute angled seeds.—Unfortunately the Peruvian specimen seen is without data, but adjacent numbers are from near Lima.

Peru: *Weberbauer 5715*. Nearly cosmopolitan.

3. **LYSIMACHIA** [Tourn.] L.

Procumbent or erect herbs with alternate, opposite or whorled leaves and variously disposed, usually white or yellow 5–6-merous flowers. Corolla lobes contorted, entire or dentate. Stamens affixed to the tube of the corolla and more or less adnate to it, sometimes with alternate staminodia. Capsule sometimes dehiscing irregularly, the seeds few to many, rarely winged.—The name is after an ancient king of Thrace.

Lysimachia andina Sandw. Hook. Icon. ser. 5. 5: *pl. 3449*. 1943.

Perennial herb with arcuate-ascending somewhat flexuose leafy stem, 3 dm. tall or taller, sparsely pilose only below but more or less minutely glandular, usually simple; lower leaves broadly obovate-cordiform, truncate-emarginate and cuspidulate at apex, to about 2 cm. long, 1.5 cm. wide, the upper lanceolate or elliptic, attenuate at base to petiole (to 5 mm. long), acuminate, 1.5– nearly 5 cm. long, 5–18 mm. wide, all chartaceous, nearly or quite glabrous, punctate and lineolate, with 3–5 lateral nerves, laxly reticulate veins; flowers all axillary, solitary, pedicels 3–5 cm. long; calyx lobes narrowly lanceolate, 4–5 mm. long, to 1.5 mm. wide, densely glandular marginally, corolla apparently nearly rotate, 1.5–2.5 cm. wide, lobes basally ovate, acute, 8–12 mm. long, 6.5–8 mm. wide, margins copiously glandular; stamens attached to a membranous ring 5 mm. above the base, the slender filaments 5.5 mm. long, the oblong-subglobose anthers to 1 mm. long; capsule 3–4 mm. long, 4–5 mm. broad after 5-valvate dehiscence, shorter than the calyx lobes, the many 3-alate seeds about 1 mm. long.

Allied to *L. chilensis* (Griseb.) Pax but flowers all solitary in the axils of the smaller leaves, corolla lobes basally ovate, capsule shorter than the longer calyx (Sandwith). The species is of exceptional interest as it is the first one found between Chile, Central America and Mexico; the author has discussed with lucidity the respective characters of the known species and suggested that the diagnostic features are the stamens with connecting basal ring and the numerous winged seeds, rather than leaf positions or form of inflorescence. Since the type is from the vicinity of Loja, the plant, in common with many others, will probably be found in northern Peru.

Peru (probably). Ecuador.

4. SAMOLUS [Tourn.] L.

Glabrous herbs with alternate leaves and racemose or corymbose 5-merous flowers on usually medially bracteate pedicels. Corolla perigynous, subcampanulate. Stamens alternating with staminodia. Capsule 5-valved with many seeds.—The classical name, after Pliny.

Samolus Verlanderi L. Sp. Pl. 171. 1753; 337. *S. floribundus* HBK. Nov. Gen. & Sp. 2: 224. 1818.

Erect, 1–3 dm. high, the lower somewhat obovate leaves rosulately crowded, 2–5 cm. long, those on the strict or sparsely branched stems smaller, the inflorescence more or less paniculately branched; pedicels slender, about 1 cm. long; flower white, 2–3 mm. long with rounded obovate retuse lobes.—Variable; the Peruvian form with pedicels, bracts and flowers somewhat smaller than the typical state of Europe, and the stems more branched, has been designated var. *americanus* Gray (var. *floribundus* (HBK.) Knuth, 338); maybe it should be treated as a distinct species. It has been noted at Lurín, near Lima. Illustrated.

Lima: About the port of Callao, *Bonpland* (type, *S. floribundus*). Hacienda Villa, *Soukup*. Cosmopolitan.

THEOPHRASTACEAE D. Don

Reference: Mez, Pflanzenreich IV. 236a. 1903.

Similar to the Myrsinaceae; leaves sometimes spinose-serrate, the flowers often larger or conspicuous, in the Peruvian genera racemose, hermaphrodite or dioecious, usually 5- or 4- rarely 3- or 6-merous. Calyx segments connate to middle or only at base if at all. Corolla fleshy, never papillose. Staminodia (Peruvian groups) granduliform or rather petaloid.

Flowers dioecious in axillary or pseudoaxillary racemes; staminodia granduliform, rarely foliaceous .... 1. *Clavija.*

Flowers hermaphrodite, mostly or all in terminal racemes, rarely pseudoaxillary; staminodia petaloid .... 2. *Jacquinia.*

1. CLAVIJA R. & P.

Suffrutescent or tree-like, characteristically with a simple trunk, this often more or less clothed with spinulose scales, and with strongly reticulate leaves crowded or connate at the tip, the polygamo-dioecious white, yellow to reddish-orange or red flowers racemose in their axils. Calyx segments usually roundish, crenulate-fimbriolate. Corolla tube broadly infundibuliform, rarely campanulate, the rounded lobes imbricate. Anthers of the female flowers free, those of the male connate into a tube. Staminodia inserted just below the base, sometimes 10, the alternate ones then smaller, fleshy or rarely thick-foliaceous. Ovary well developed only in female flowers, glabrous, the stigma discoid. Fruit drupaceous.—The authors dedicated the genus to a friend, Jos. Clavijo Paxardo. *C. pendula* R. & P. Syst. 285. 1798 has not been identifiable. It may be *C. pungens. Williams 4174* from the Lower Huallaga, the wood described by the collector, Field Mus. Bot. 15: 406. 1936, was not sent me, but the native name "trompetero-sacha" may be recorded here. Two keys follow.

KEY TO CLAVIJA (after Mez)

Staminodia 10, 5 often smaller and epipetalous.

- All coalescent into an irregular fleshy annulus ...... *C. euerganea.*
- All distinct.
  - Leaves subentire or obscurely serrulate .... *C. Weberbaueri.*
  - Leaves remotely and minutely spinulose .... *C. Jelskii.*
  - Leaves densely spinose.

Sepals and petals broadly rounded; staminodia equal. *C. pungens.*

Sepals and petals acutish; epipetalous staminodia smaller. *C. Radlkoferi.*

Staminodia 5, distinct, episepalous.

Annulus fleshy, entire, at the corolla throat with the staminodia. *C. Hookeri.*

Annulus obscure, distinct from the staminodia or irregularly sulcate.

Staminodia plane, not globose, more or less foliaceous.

Leaves more narrowed to base than to apex, cuneate-oblong or -elliptic.

Staminodia ciliolate; pedicels straight.

Leaves spinulose-dentate.................. *C. parvula.*

Leaves entire.......................... *C. longifolia.*

Staminodia eciliate; pedicels curved or nodding.

Pedicels to 1.5 mm. long; staminodia suborbicular. *C. tarapotana.*

Pedicels 3–4 mm. long; staminodia claviform. *C. reflexiflora.*

Leaves about equally narrowed both ends....... *C. elliptica.*

Staminodia fleshy, subglobose.

Staminodia basally joined by a glandular irregularly sulcate annulus.

Male flowers with pedicels 1 mm. long....... *C. Poeppigii.*

Male flowers with pedicels 2.5 mm. long....... *C. Hookeri.*

Staminodia entirely distinct.

Flowers about 12 mm. across.

Leaves entire.......................... *C. spathulata.*

Leaves remotely dentate or subentire........ *C. fulgens.*

Flowers at most 7 mm. across.............. *C. parviflora.*

ALTERNATE KEY TO CLAVIJA

Leaves more or less spinulose, sometimes minutely and remotely, but evidently; staminodia 5 or 10, 5 often smaller and epipetalous.

Dentations conspicuous, rather irregular, approximate, equally developed from base to apex of leaves.

Flowers (type) 4-merous, about 5 mm. wide; pedicels soon 8 mm. long or longer......................... *C. Radlkoferi.*

Flowers often 5-merous; pedicels 4–6 mm. long.

Leaves cuneate to petiole, this to 3 cm. long; staminodia free. *C. pungens.*

Leaves little narrowed to short petiole; staminodia coalescent. *C. euerganea.*

Dentations inconspicuous, subregular, remote, often entirely or mostly below middle of leaves.

Leaves large, to 13 cm. wide; flowers about 1 cm. wide. *C. Jelskii.*

Leaves small, to 6 cm. wide; flowers to 5 mm. wide. . *C. parvula.*

Leaves entire or more or less denticulate but teeth not spinulose.

Leaves nearly or quite equally narrowed both ends, the blade not or little decurrent on the well-defined petiole.

Leaves mostly obscurely and minutely denticulate; flowers red, to 1 cm. wide.......................... *C. Weberbaueri.*

Leaves entire; flowers yellow to orange-red, 4–8 mm. wide.

Pedicels divaricate-ascending; flowers 4–5 mm. wide. *C. elliptica.*

Pedicels reflexing; flowers 6–8 mm. wide....... *C. reflexiflora.*

Leaves obviously more gradually narrowed to base than to apex and usually decurrent on the often merging petiole.

Staminodia subglobose, enclosed in fleshy entire annulus; pedicels slender, to 4 mm. long; leaves not margined. *C. Hookeri.*

Staminodia various but annulus, if present, not as above; pedicels stout or short; leaves marginally nerved or zoned except *C. Poeppigii, C. parviflora.*

Flowers small, always less than 1 cm. across.

Staminodia foliaceous, plane, not globose; leaves, especially toward tip, yellowish-margined.

Leaves coriaceous; racemes subpuberulent, staminodia ciliate............................. *C. longifolia.*

Leaves chartaceous; racemes glabrous as staminodia. *C. tarapotana.*

Staminodia globose; leaf margins not yellowish, thickened, sometimes hyaline.

Flowers about 7 mm. wide; leaves often with a few trichomes on nerves beneath........... *C. Poeppigii.*

Flowers about 4 mm. wide; leaves glabrous. *C. parviflora.*

Flowers large, 10–18 mm. across.

Leaves densely reticulate both sides, entire. . *C. spathulata.*

Leaves obscurely reticulate, slightly denticulate toward tip. *C. fulgens.*

Clavija elliptica Mez, Bull. Herb. Boiss. sér. 2. 5: 537. 1905.

Type a shrub to 1 meter high; petioles very slender, to 2.5 cm. long; leaves elliptic, entire, equally gradually acute to base and apex, to 2 dm. long, 5.5 cm. wide, chartaceous, glabrous, densely and prominently reticulate both sides, finely but inconspicuously lineolate; male inflorescences slender, to 20-flowered, 1 dm. long or longer, the female much smaller and denser; flowers 4–5-merous, scarcely wider than 4 (5) mm., the suborbicular free sepals ciliate, the petals even medially connate, lobes entire; pedicels slender, 2–3 mm. long; stamens exserted, the staminodia broadly foliaceous-squamiform, not forming annulus with fleshy glands; anthers shorter than filament tube; fruit smooth, orange-colored, scarcely 1 cm. in diameter.—Flowers pale yellow to orange (Ule). F.M. Neg. 4809.

Loreto: Mishuyacu, near Iquitos, *Klug 2552* (det. Standley). Yurimaguas, *Williams 4611; 4187?; 4660?* (fruit); *Killip & Smith 27692?* (fruit). Brazil.

Clavija euerganea Macbr. Field Mus. Bot. 8: 126. 1930.

Glabrous, the rather rigid leaves coarsely and irregularly spinose-serrate, the 5-merous flowers brick-colored, remotely borne in racemes 7–15 cm. long; petioles 5–7 mm. long; leaves obovate-oblong, sometimes nearly oblong, rounded or acutish at tip, 13–17 cm. long, 4–5.5 cm. wide, narrowly yellow-margined and finely reticulate-veined both sides; pedicels erect and nodding, to 4 mm. long; bracts ovate, acute, ciliolate; flowers nearly 15 mm. across, the basally connate sepals orbicular, minutely ciliate, the petals more than one-third connate, semiorbicular, crenulate, nearly 5 mm. long; staminodia coalescent into an irregular fleshy ring around the corolla throat; stamens slightly emerging, the tube a little longer than the anthers.—Type from a shrub 5 meters high. *C. Eggersiana* Mez, 18, of Ecuador, and *C. Lehmannii* Mez, 18, of Colombia, both have entire leaves, the male inflorescence of the former very lax, sepals serrulate, that of the latter short and dense, sepals coarsely crenate. Besides Peruvian species with serrate leaves there is *C. cauliflora* Regel, 21, like *C. Radlkoferi* but racemes only about 3 cm. long.

Tumbez: In deciduous bushwood east of Hacienda Chicama, *Weberbauer 7657*, type.

Clavija fulgens Hook. f. Bot. Mag. *pl. 5626*. 1867; 26.

Apparently allied to *C. spathulata* but the leaves with a few remote (and apparently obscure) teeth toward the tips, 2.5–3 dm. long, 7.5–12.5 cm. wide, obscurely reticulate and the many racemes very dense, the short stout pedicels glabrous; flowers red, 14–18 mm. long; staminodia fleshy, subhemispheric; stamens small, the anthers subquadrate; style very short, the stigma capitate.—Type from an unbranched garden plant 1 meter high, showy by the abundantly flowered and numerous racemes.

Peru(?): Native land unknown.

Clavija Hookeri A. DC. Prodr. 8: 148. 1844; 21.

Stems or branches, petioles, these to about 5 cm. long, racemes and pedicels (to 4 mm. long) slender; leaves narrowly oblong, very gradually narrowed to base, shortly acuminate, about 2.5 dm. long, less than 1 dm. wide, entire or with a few remote teeth, neither zoned nor thickened marginally, very sparsely lepidote-punctulate, densely lineolate; racemes shorter than the leaves or the male nearly as long, pendulous; flowers 3–4 mm. long, 4- or 5-merous; sepals broadly ovate, crenate; petals connate scarcely to the middle, entire or very minutely serrulate; staminodia 5, episepalous, distinct, ovoid and with an entire fleshy annulus; stamens little exserted (male flowers), the filament tube free from the petals, much longer than the anthers. —Illustrated (as *C. spathulata*), Hook. Icon. Pl. 2: *pl. 140*.

Peru: Without locality, (*Mathews 1600*). Colombia.

Clavija Jelskii Szyszyl. Dissert. Classis Math.-Phys. Acad. Litt. Cracov. 29: 225. 1894; 19.

Leaves oblong, gradually decurrent into the petiole, this sometimes about 4 cm. long, obtusish at tip, to 6 dm. long, 13 cm. wide, with few papillae above, densely lepidote-papillose beneath; racemes dense, few-flowered, nearly glabrous, 7 cm. long (only 1 known), the apparently nodding pedicels less than 5 mm. long; flowers about 12 mm. wide, 5-merous; sepals nearly free, suborbicular, crenulate and fimbriolate, the minutely crenulate petals one-third connate;

staminodes 5 with also 5 epipetalous ones, thick pulviniform forming a glandular annulus around the corolla throat from which the stamens are scarcely exserted, the more or less joined anthers appearing from above like a 10-toothed disk.—F.M. Neg. 31970.

Cajamarca: Tambillo, *Jelski 260 (269)*, type. "Casha."

Clavija longifolia R. & P. Syst. 284. 1798; 24. *C. Ruiziana* (Kuntze) Mez, Pflanzenreich IV. 236a: 23. 1903. *Theophrasta Ruiziana* Kuntze, Rev. Gen. Pl. 2: 404. 1891.

Petioles 5.5 cm. long, more or less margined above by the decurrent cuneate-based oblong leaves, these narrowly rounded or acutish at apex, coriaceous, entire and with a narrow yellowish marginal zone, about 5.5 dm. long, 12–15 cm. wide, above scarcely, beneath very minutely and sparsely, punctulate; racemes lax, 12–16 cm. long, spreading puberulent, the pedicels at anthesis to 2 mm. long, early not at all nodding; flowers orange-colored, 6–7 mm. wide, 5-merous, the sepals basally connate, broadly ovate-elliptic, a little pilose and ciliate, the suborbicular petals obscurely so; staminodia foliaceous, strictly episepalous, ovate, narrowly rounded, minutely ciliolate; stamens included, the anthers truncate, free; fruit the size of a cherry, drying orange-color, obscurely tessellate-spotted, many-seeded.—My specimen was once referred by me to *C. Poeppigii* but the leaves are yellow-margined; the staminodia were not examined. *C. tarapotana,* maybe represented by the Klug specimen, seems merely a glabrous state; in the foliaceous staminodia suggests *Jacquinia.* Mez retained *T. longifolia* Jacq. of northern South America, and sometimes cultivated, which, since the adjective is preoccupied in *Clavija* by the above must be known as *C. ornata* D. Don.

San Martín: Juanjuí, *Klug 3799* (det. Standley, *C. Poeppigii*).—Huánuco: Chicoplaya, (*Tafalla*, type). Río Huallaga, cañon below Río Santo Domingo, *4262* (*C. Poeppigii* in herb.).—Loreto: Puerto Arturo, *Williams 5337*.

Clavija parviflora Mez, Pflanzenreich IV. 236a. 27. 1903.

Leaves elliptic-oblong, more or less narrowed to petiole but this rarely 2.5 cm. long, acute or shortly acuminate, entire (or the few teeth minute, little obvious), chartaceous with narrow hyaline margin, to about 3.5 dm. long, 1 dm. wide, very sparsely and minutely lepidote puncticulate beneath; male racemes lax, about 1.5 dm. long, the pedicels erect, the female racemes scarcely more than 3 cm. long, the pedicels somewhat spreading, 1–1.5 mm. long; flowers scarcely more than 4 mm. wide, 5-merous, the male unknown; sepals minutely crenulate, nearly free; staminodia 5, distinct, globose, fleshy; stamens sterile, free, the broadly truncate 4-sulcate anthers shorter than the filaments; style obvious; placentae about 8-ovuled.—Among Peruvian species nearest *C. spathulata* or *C. fulgens; C. boliviensis* Mez, 26, has female racemes about 1 dm. long. F.M. Neg. 31973.

Loreto: Yurimaguas, *Poeppig 2352B*, type. Salvo on Río Purus, *Trail 509*. Brazil.

Clavija parvula Mez, Pflanzenreich IV. 236a: 23. 1903.

Leaves narrowly oblong, gradually narrowed to petioles (these scarcely more than 1.5 cm. long and like the branchlet tips farinose), rounded at apex, densely spinose-dentate, about 2 dm. long, 6 cm. wide, coriaceous, glabrous; male racemes (female unknown) about 6 cm. long, glabrate, the spreading pedicels 1–1.5 mm. long; flowers yellow, about 5 mm. broad, 5-merous, the nearly free suborbicular sepals minutely crenulate, the petals obscurely so; staminodia 5, subfoliaceous, shortly fimbriolate; stamens exserted, the peltate anthers connivent.—Allied apparently to *C. longifolia* but it is another imperfectly known species. F.M. Neg. 4875.

Puno: *Gay 1129*. Ecuador.

Clavija Poeppigii Mez, Pflanzenreich IV. 236a: 25. 1903.

Leaves oblong, gradually narrowed into the petioles (these 6–8 cm. long), shortly but obviously acuminate, entire or with a few approximate teeth, chartaceous, the margins not at all yellowish, thickened, about 5 dm. long, 12 cm. wide, very lustrous and glabrous except (sometimes) for some scattered trichomes that persist only on the prominent nerves and midrib; racemes pilose, to 1.5 dm. long, the erect pedicels to 1.5 mm. long, the 5-merous flowers about 7 mm. broad; sepals sparsely pilose, as much as one-fifth connate, the suborbicular lobes strongly ciliate, the petals merely crenulate; staminodia 5, distinct, subglobose with a glandular fleshy annulus at base; stamens subexserted, the anthers free.—The Killip and Smith collections are in young flower or in fruit, this yellow, obscurely tessellate, about 2 cm. in diameter. Determinations, except *Klug 1611*, by Standley. F.M. Neg. 4876.

San Martín: Tocache, *Poeppig 1942*, type; also *2022*.—Loreto: Yurimaguas, *Killip & Smith 27687; 28290; Williams 4137*. Balsapuerto, *Killip & Smith 28445; 28585*. Soledad on Río Itaya, *Killip & Smith 29588; 29815*. Río Putumayo on the boundary, *Klug 1611*.

Clavija pungens (Willd.) Radlk. Sitzber. Acad. München 19: 254. 1889; 20. *Theophrasta pungens* Willd. ex Roem. & Schult. Syst. 4: 787. 1819. *C. undulata* D. Don, Edinb. Phil. Journ. 234. 1831.

Leaves obovate-oblong or oblong, gradually narrowed into petioles, these about 1.5 cm. long, rounded at apex or shortly acute, to 18 cm. long, 7 cm. wide, densely rigid spinose (the spinose teeth to 5 mm. long), minutely and very obscurely lepidote-punctulate beneath; racemes slender, about 11 cm. long, the mostly nodding or irregularly curving pedicels to 6 mm. long; flowers apparently secund, about 7 mm. broad, 5-merous, the rounded-ovate fimbriolate sepals nearly one-fourth connate, the suborbicular petals little crenulate; staminodia alternating with equally large epipetalous ones, more or less antheriform; anthers joined to appear from above a 10-toothed disk.—Illustrated, Mez, l.c., 20.

Huánuco: Chicoplaya, *Ruíz & Pavón*.—Cuzco: Echarate, Prov. Convençion, *Goodspeed Exped. 10470* (det. Standley). Ecuador.

Clavija Radlkoferi Mez, Pflanzenreich IV. 236a: 21. 1903.

Resembles *C. pungens* but, as to type, petioles only about 1 cm. long, leaves obovate, to 4.5 dm. long, 1.5 dm. wide, the teeth more remote and both surfaces, especially the upper, lineolate; racemes to 22 cm. long, very lax, the lower pedicels to 15 mm. long; flowers 4-merous, 7–8 mm. long, the broadly ovate sepals ciliate-serrate and, like the petals, broadly acutish; epipetalous staminodia smaller than the others.—Meritoriously commemorates the great nineteenth century botanist of Munich. F.M. Neg. 20052.

Peru(?): Cultivated in the botanical garden of Munich, the native land unknown.

Clavija reflexiflora Killip, Journ. Wash. Acad. Sci. 21: 350. 1931.

Shrub or small tree, the simple erect trunk leafy only apically, early finely rusty tomentose; leaves elliptic-oblong, 1.5–3.5 dm. long, 6–12 cm. wide, broadest just above the middle, acute or acuminate, tapering to petiole 7 cm. long (petioles rusty tomentose at the geniculate base, glabrous, sulcate above), entire, subcoriaceous, thicker at margin, lustrous and glabrous but sparingly lepidote punctate beneath, prominently nerved and veined; racemes glabrous, 7–8 cm. long, the strongly reflexed pedicels 3–4 mm. long; bracts persisting, ovate, 1–1.2 mm. long; male flowers 4- or 5-merous, the sepals and petals both half connate, the former ovate-orbicular, ciliate, the orange-red or orange-yellow corolla 6–8 mm. wide with obtusish minutely crenulate lobes; staminodia 5, episepalous, distinct, claviform; fruit globose, 1.5–2 cm. thick, glabrous, color of flowers.—Keys to *C. longifolia* R. & P. with somewhat narrower leaves, rather smaller male flowers; probably, however, is nearest *C. parviflora* with shorter petals, erect pedicels, and globose staminodia; the somewhat similar *C. Poeppigii* has leaves slightly pilose beneath (Killip); however, cf. the apparently similar *C. elliptica.*

Loreto: In dense forest, San Antonio on Río Itaya, *Killip & Smith 29345,* type. Mishuyacu, *Klug 219; 1320.* Yurimaguas, *Killip & Smith 27674.* Near Balsapuerto, *Killip & Smith 28112.* Along Río Marañón near mouth of Río Huallaga, *Killip & Smith 29191; 29203.* Puerto Arturo, *Killip & Smith 27916.*

Clavija spathulata R. & P. Syst. 285. 1798; 26.

Petioles 1–2.5 cm. long, narrowly winged above by the cuneately based decurrent leaves, these acutish or subrotund at tip, minutely and scattered punctulate beneath, coriaceous or rigid, to about 4 dm. long, 11 cm. wide; racemes a dm. long, sometimes nearly twice as long, minutely furfuraceous or glabrate, the not at all or nutant stout pedicels 2–3 mm. long; flowers about 12 mm. broad, 5- and 6-merous, the broadly rounded sepals crenulate, the petals so only on the upper portion; staminodia 5, episepalous, distinct, fleshy clavate, neither papillose nor emarginate; stamens scarcely exserted, the truncate anthers from above appearing united into a 4-dentate body; ovary glabrous, clavate, the style nearly obsolete, the stigma obtuse.—Mez described the pedicels as not at all nutant; they are distinctly reflexing in the specimen of the Prodromus Herbarium, Geneva. F.M. Neg. 7490.

Huánuco: In woods, Muña, *Ruíz & Pavón,* type. "Monte lucuma."

Clavija tarapotana Mez, Pflanzenreich IV. 236a: 24. 1903. *C. tarapotana* Rusby, Bull. N. Y. Bot. Gard. 8: 111. 1912?

Glabrous, the simple trunk 2–3 meters high; leaves oblong, gradually narrowed into the petioles (these to 2 cm. long), shortly but acutely acuminate, about 4 dm. long, 8.5 cm. wide, chartaceous with a yellowish marginal zone especially toward the tips, entire, the nerves prominent; racemes slender, mostly 9 cm. long, glabrous, the secund nodding-recurved pedicels to 1.5 mm. long; flowers to 9 mm. broad, 4- and 5-merous, the broadly rounded nearly free sepals ciliolate-serrulate, the broad petals scarcely crenate; staminodia suborbicular, foliaceous, distinct, eciliate; stamens exserted, the filament tube and coalescent anthers subequal.—Doubtfully distinct from *C. longifolia.* Rusby wrote of his species from Bolivia: the same as *Spruce 4149;* leaves 4–8 dm. long, 4–7 cm. wide, reticulation very fine, prominent both sides; fruiting pedicels about 5 mm. long, calyx 4–5 mm. broad; fruits globose, 12 mm. broad, faintly reticulate, the 8 mm. long seed borne on short flattened lightly winged funicle. F.M. Neg. 31971.

San Martín: Tarapoto, *Spruce 4149,* type; *Williams 6277.* Bolivia?

Clavija Weberbaueri Mez, Repert. Nov. Sp. 3: 104. 1906.

A meter high shrub; petioles smooth, slender, to 6.5 cm. long; leaves elliptic, mostly minutely or obscurely serrulate, subequally narrowed at both ends, about 3 dm. long and at least a third as wide, rather rigid, reticulate both sides, lineate, sparsely pilose with long trichomes beneath; racemes (male) suberect, about 1 dm. long, nearly glabrous; pedicels stout, to 2.5 mm. long, very minutely bracted; flowers red, 5-merous to 1 cm. broad, the suborbicular nearly free sepals marginally ciliate, the petals to one-third connate, their minutely crenulate lobes not at all emarginate; stamens exserted from the throat, the thick glands with smaller epipetalous bodies alternating; anthers shorter than the filament tube; ovary glabrous.—The smooth lustrous fruits of my collection are 2 cm. in diameter. Affine *C. latifolia* Radlk., 18, of Colombia, with thinner leaves that are conspicuously reticulate beneath and somewhat spinose petioles. F.M. Neg. 4818.

Junín: Near La Merced, 700 meters, *5424; Weberbauer 1836,* type; 282.

2. JACQUINIA L.

Shrubs, or in Peru a tree, with pseudo-verticillate pungent or spinose-tipped rigid-coriaceous leaves, nodding terminal inflorescences of hermaphrodite flowers, the staminodia petaloid, and orange-colored fruits; otherwise much like *Clavija.*—Commemorates Nicol Jos. de Jacquin.

Jacquinia pubescens HBK. Nov. Gen. & Sp. 3: 251. *pl. 246.* 1819; 44. *J. mucronata* Roem. & Schult. Syst. 4: 802. 1819. *J. Sprucei* Mez, Pflanzenreich IV. 236a: 43. 1903, fide Svenson.

Branchlets puberulent; petioles 2–3 mm. long; leaves elliptic or somewhat obovate, more or less acute to base, rounded but abruptly spinose-mucronate at tip, the mucro to 3 mm. long, glabrous or nearly and punctulate above, softly puberulent beneath, mostly about 3.5–4 cm. long, 1.5–2 cm. wide, the 4–10-flowered erect inflorescences about as long; sepals crenulate, the broad lobes of the short corollas entire or crenulate as the scarcely shorter staminodia; style short to 3 mm. long with pulvinate or discoid stigma.—A tree to 3 meters high with dark green leaves and dull orange flowers, often forming small groves on level land where the straight thick trunks and nearly black evergreen foliage make it outstanding in the landscape; the poisonous fruit, as large as a small lemon, matures to a dull orange color (Svenson, Amer. Journ. Bot. 33: 472. 1946, with photograph of fruiting branch, *pl. 1,* not *8, fig. 6,* l.c. 396, and habitat photo, l.c. *pl. 2, fig. 6*). According to Svenson, the roots are dug "for their insecticidal content," the local name being "barbasco." F.M. Negs. 38718; 20054; 26662 (two are *J. Sprucei*).

Cajamarca: Tomependa, Prov. Bracamoros, *Bonpland,* type. Bellavista, near Jaén, 750 meters, *Weberbauer 6212.* Southwestern Ecuador. "Llisha" (Weberbauer).

MYRSINACEAE

Reference: Carl Mez, Pflanzenreich IV. 236. 1902.

Shrubs or trees with simple estipulate alternate leaves or these sometimes so approximate, especially toward the tips of the branchlets, as to appear opposite or verticillate, always more or less obviously punctate or (and) lineate, pellucidly so, at least in the younger. Inflorescences terminal or lateral, indefinite, simple or composite, the small regular flowers hermaphrodite or dioecious, usually 5- or 4-merous. Calyx persisting; corolla often rotate, the commonly papillose and glandular punctate or lineate segments only sometimes valvate, opposite and below frequently connate (or forming a ring) with isomerous stamens, the anthers dehiscent by apical or subapical pores or longitudinally. Ovary superior, free, 1-celled, sessile, the style sometimes slender, the stigma punctiform or variously developed; ovules many or few, multi- or uniseriate; fruit baccate or drupaceous, indehiscent (description applicable for Peru).

Demarcation of species groups, and particularly of species, is often weak; the character concomitance regarded as basic for genera has not been used consistently in the classification structure and thus a naturally "difficult" family has not been given, probably, as clear and useful taxonomy as may be possible by later students; also, there are some contradictions in descriptions and keys—to cite only one example, *Ardisia*, flowers 5-merous, l.c. 59, or normally 4-merous, l.c. 62; only good fortune may have saved me from copying or making similar *faux pas*. Nevertheless, my great indebtedness to Mez' work, from which I have compiled freely, will be evident. With present knowledge of the Peruvian forms, specimens in fruit are ordinarily not determinable, even generically. The generic key, in part, is applicable only for Peru, and the generic characters are variable or intangible and thus not always definitive.

Flowers umbellately crowded on more or less obvious often nodiform squamate branchlets; ovules uniseriate............1. *Rapanea*.

Flowers in more or less elongate inflorescences or these if short (as sometimes in *Stylogyne*) not umbellate on short branchlets; ovules uniseriate except *Ardisia*.

  Filaments obsolete or stout and usually shorter than anthers, these broader than high or subrotund; flowers in axillary racemes except *C. Poeppigii*.

    Flowers usually hermaphrodite, 5-merous; leaves to 2 cm. wide. 2. *Grammadenia*.

    Flowers usually dioecious, 4-merous; leaves ample. 3. *Cybianthus*.

  Filaments filiform, longer than anthers, these scarcely if at all higher than broad; flowers dioecious, in axillary racemes or panicles....................................4. *Weigeltia*.

  Filaments always developed, rarely obscure, often at least as long as anthers, these never wider than long, usually narrower, ordinarily rather ovate, apically acute or rounded.

    Style slender, elongate, stigma punctiform; ovules more or less clearly pluriseriate; filaments usually stout, affixed near corolla base, at most as long as narrow anthers, stamens shorter than narrow, shortly connate petals (Peru, except *A. venosissima*, filaments coalescent, stamens long, unless *A. esculenta*); flowers subracemose in open panicles or subumbellate or subcorymbose in denser axillary ones (Peru). 5. *Ardisia*.

    Style and other characters as above (or nearly) but ovules uniseriate; panicles of subumbellate flowers lax, mostly about as long or longer than leaves (Peru).........6. *Parathesis*.

    Style stout, often not longer than ovary, stigma more or less enlarged; ovules uniseriate; filaments filiform or elongate or, if short, not basally inserted and petals more or less connate.

Filaments and anthers subequal or former longer than latter, affixed near corolla base (see also *Conomorpha myriantha*).

Calyx closed to anthesis of flowers, these in terminal inflorescences (usually panicles) about as long as leaves. 7. *Geissanthus*.

Calyx open in bud, the inflorescences sometimes shorter than petioles or the more or less umbellate flowers in panicles or racemes much shorter than leaves except *S. ambigua*.......................... 8. *Stylogyne*.

Filaments typically much shorter than anthers (longer in *C. myriantha*), stout, affixed above the base, the petals high-connate; flowers in simple or few-branched axillary racemes or sometimes in terminal compound inflorescences............................ 9. *Conomorpha*.

1. **RAPANEA** Aublet

Glabrous or pubescent, the usually entire leaves often lepidote, shrubs or sometimes trees distinctive especially by the small bracteate or squamulate flowers crowded umbellately on short branchlets, these often nodiform. Flowers 4–5- rarely 6- or 7-merous, the imbricate or valvate sepals usually free or nearly, often glandular pictate or punctate, the similar petals more often somewhat connate, ordinarily spreading or recurved, commonly papillose marginally, stamens inserted in corolla throat, the filaments obsolete, the anthers usually joined dorsally to the petals, ovate or elliptic, acuminate, longitudinally dehiscent. Ovary globose or ellipsoid, the style in female flowers none, the sessile stigma in the American species morchelliform or lobate; ovules uniseriate, few. Fruit dry or fleshy, sometimes ligneous, 1-seeded.—The name stems from a native one of British Guiana; it may be remarked for students of distribution that this genus is scarcely more than a convenient segregate of *Myrsine* L. Species have been distinguished here and in other genera on the presence or absence of glandular punctation, especially on sepals or petals, a doubtfully significant character.

Leaves more or less equally and obviously narrowed to both ends.

Indument of leaves beneath more or less promptly deciduous. *R. ferruginea*.

Indument of leaves beneath more or less persisting....*R. Jelskii.*

Leaves rounded to acute at base, broadly to narrowly rounded at apex.

Leaves at most about 2 cm. wide, mostly or all usually narrower.

Branchlets and leaves, at least the younger, puberulent or ciliate.

Flowers usually 4-merous; petioles rarely 3 mm. long. *R. dependens.*

Flowers usually 5-merous; petioles often nearly 4 (–6) mm. long.

Younger leaves ciliolate marginally; branches glabrate.

Sepals acute; leaves to 2.5 cm. long...........*R. brevis.*

Sepals rounded; leaves mostly 3–3.5 cm. long..*R. andina.*

Younger leaves not or obscurely ciliolate; branches reddish tomentulose............................*R. Lechleri.*

Branchlets and leaves glabrous.

Leaves elliptic, about twice longer than wide, broadly rounded at tip.

Leaves chartaceous-coriaceous, drying red beneath; sepals acutish...............................*R. Sprucei.*

Leaves rather rigid coriaceous, drying pale beneath; sepals rounded............................*R. sessiliflora.*

Leaves lanceolate, at least three times longer than wide, narrowly rounded apically...................*R. Pearcei.*

Leaves all or mostly about 3 cm. wide or wider (several species proposed doubtfully valid).

Leaves nearly oblong, those of branchlets mostly 2.5–4 cm. wide (probably one variable species).

Leaves described as lineate-resiniferous, sepals as rounded or obtusish...................*R. pellucida, R. manglillo.*

Leaves described as not lineate, sepals acute or narrowly rounded..................*R. rivularis, R. oligophylla.*

Leaves more or less elliptic, often wider than 4 cm. (probably only one species).

Leaves about twice as long as wide, opaque..*R. Weberbaueri.*

Leaves more than twice as long as wide, more or less lustrous.

Pedicels to 1 mm. long..................*R. leuconeura.*

Pedicels 2–3 mm. long......................*R. latifolia.*

Rapanea andina Mez, Pflanzenreich IV. 236: 378. 1902.

Glabrous in age, the branchlet tips and the young leaves somewhat pilose or ciliate; petioles to 6 mm. long; leaves elliptic, merely acute at base, rounded or obscurely acuminate at apex, to about 4 cm. long, 18 mm. wide, very lustrous above, black punctate beneath; inflorescence capitate-glomerate, 5–15-flowered, shorter than the petioles; flowers glabrous, 3–3.5 mm. long, mostly 5-merous, the female subsessile (ovary globose, stigma depressed lobate), the male on stout pedicels scarcely 1 mm. long; sepals broadly rounded, prominently ciliate, to one-third connate; petals one-fourth or more connate, acute, with round and long pictae, the lobes of the female flowers merely acutish; anthers acute.—*R. Mandonii* Mez, l.c., of Bolivia is said to differ by the obscurely punctate sepals, the leaves somewhat reticulate instead of merely costate beneath. F.M. Neg. 4882.

Cajamarca: Callacate, (*Jelski 12*). Without locality, (*Ruíz & Pavón*). Ecuador.

Rapanea brevis Macbr. Candollea 5: 396. 1934.

Apparently a small shrub, the more or less pulverulent branches and branchlets tardily glabrate; petioles stout, glabrous, nearly 4 mm. long; leaves very numerous, drying brown, much paler beneath, glabrous except the younger, sparsely ciliate on the margins, ovate-elliptic, barely acute at base, rounded or sometimes slightly acute at tip, 2–3 cm. long, 12–15 mm. wide, seemingly evenose, somewhat lustrous above, densely punctate beneath at the margins; inflorescence very short, the few flowers subsessile, the fruiting pedicels only 0.5 mm. long; sepals subovate, acutish, glabrous; petals to about one-fourth connate (male), the lobes ovate, acutish, minutely pulverulent and sparsely black-dotted marginally; ovary well developed; stigma large, subpyramidal, obscurely lobed.—Allied, I suppose, to *R. andina* Mez but the pubescence persisting, the sepals acute and the leaves much shorter; these differences could conceivably be variable.

La Libertad: Tayabamba, Prov. Pataz, *Weberbauer 7025*, type.

Rapanea dependens (R. & P.) Mez, Pflanzenreich IV. 236: 377. 1902. *Caballeria dependens* R. & P. Syst. 1: 281. 1798. *C. myrtifolia* R. & P. ex DC. Prodr. 8: 102. 1844. *Myrsine ciliata* HBK. Nov. Gen. & Sp. 3: 248. 1819.

Closely branched, sometimes several meters high, the branchlets early densely rusty tomentose; petioles rarely as long as 3 mm.; leaves typically elliptic varying to obovate or even suborbicular, commonly rounded or emarginate but often apiculate, about 2 cm. long, 12 mm. wide, or much smaller, or even 3 cm. long, at least half as broad, lustrous but densely scrobiculate above, closely reddish punctate or pitted (the pubescence deciduous) beneath; nodes 1–3- (–4) flowered, little exceeding the petioles, the glabrous pedicels rarely 1 mm. long; flowers 4-merous, 3–4 mm. long, glabrous, the sepals to one-fourth connate, the broadly ovate acutish lobes typically densely pictate; petals nearly free, rounded, with some elongate pictae; anthers subrotund; ovary (female flowers) globose, the large conical stigma acute.—Var. *saxatilis* Macbr. Field Mus. Bot. 8: 127. 1930, differs in the obtuse or rounded petals with none or very few punctules, the type of this a very bushy 1 meter shrub on rocky wet montaña, the species commonly growing on well-drained slopes; there seems, however, to be only one difference, the lack of black glands on the petals. The Colombian *R. myrtoides* (Hook.) Mez is similar but the leaves are subsessile. F.M. Neg. 26688.

Cajamarca: Hualgayoc, 3,000 meters, *Weberbauer 4022;* 261.—Ancash: Conin, *Weberbauer 2914.*—Huánuco: Prov. Huamalies, *Weberbauer 3399.* Chaglla, *Weberbauer 6691* (det. Mansfeld). Yanano, *3742.* Mito, *1437; 1471.* Muña, *Ruiz & Pavón,* type. Playapampa, *4865* (var.).—Junín: East of Palca, *Weberbauer 2483;* 249.—Huancavelica: Salcabamba, 3,300 meters, 5-meter tree with glossy leaves, *Stork & Horton 10310* (det. Standley).—Ayacucho: Prov. Huanta, *Weberbauer 5574.* Above La Quinua, 3,300 meters, *Weberbauer 5538.*—Apurímac: Chincheros, much-branched 3 to 4 meter shrub, in shrubwood at 2,800 meters, *Stork & Horton 10757* (det. Standley). Bolivia to Colombia and Venezuela. "Gonga-pacush."

Rapanea ferruginea (R. & P.) Mez in Urban, Symb. Ant. 2: 429. 1901; 381. *Caballeria ferruginea* R. & P. Syst. 280. 1798. *Myrsine tomentosa* Presl, Rel. Haenk. 2: 63. 1835.

Densely leafy shrub, sometimes, apparently, 6 meters high or higher, the slender younger branchlets more or less tomentulose or even subvillous, the mature leaves glabrate (rarely glabrous) or slightly puberulent near or on the midnerve; petioles 5–12 mm. long; leaves oblong-lanceolate, narrowed to both ends, acutish, to 9 cm. long, 3 cm. wide, often smaller, chartaceous or coriaceous, scarcely or rather prominently veined, punctate beneath; umbels sessile or nearly, 3–12-flowered, glabrous or pilose, the subsessile flowers 2–3.5 mm. long, the shortly pedicellate fruits about 2.5 mm. in diameter, finally reddish with many lineate pictae; sepals rounded or acutish, connate above the middle, more or less punctate; petals one-third connate, acutish or rounded, with many elongate punctae; anthers epunctate, shortly or obscurely acuminate; stigma (female flowers) morchelliform.—Several forms have received names. In the type the rusty indument is almost velvety on youngest branchlets and midribs of young leaves beneath. The wood is used for huts (Mexia).

Cajamarca: Huancabamba, *Weberbauer 6115*. Above Tabaconas, *Weberbauer 6307*.—San Martín: Tarapoto, *Williams 7505*. Zepelacio, *Klug 3591*. Moyobamba, *Weberbauer 4479;* 290.—Huánuco: Below Ambo, *2414*. Muña, *Ruiz & Pavón,* type. Río Ysabel, 1,000 meters, *Mexia 8162* (det. Standley).—Junín: La Merced, *Schunke A35; 212; 326; 323*. Chanchamayo, *Isern 2177; Schunke 269*. Carpapata, *Killip & Smith 24491*. Near Palca, *Weberbauer 2183;* 247.—Cuzco: Wood margin near Santa Isabel, 1,100 meters, *West 7127* (det. Johnston). Argentina and Chile to Mexico and the West Indies. "Lucumas," "manglillos," "lamacha" (Bolivia).

Rapanea Jelskii (Zahlbr.) Mez, Pflanzenreich IV. 236: 379. 1902. *Myrsine Jelskii* Zahlbr. Ann. Naturh. Hofmus. Wien 7: 3. 1892.

Young branchlets densely—the tips velvety—reddish tomentulose as the petioles (these to 15 mm. long) and midnerves of the young leaves, a fine sparse puberulence persisting some time on both sides of the latter which are finally a little lustrous above and scrobiculate (the parallel nerves rather prominent), lanceolate, acute both ends, 7–9 cm. long, 2 cm. wide; flowers 6–4-glomerulate, the pedicels scarcely 1 mm. long (only the male known); sepals to one-third connate, ovate, acute, minutely fimbriate; petals similarly connate, elliptic-lanceolate, acute, coarsely lineate-pictate; anthers ovate-elliptic, acuminate.—The tendency of the indument to persist is a distinction of questionable merit from *R. ferruginea*. It is doubtful if the Weberbauer records (save *4104*) are correct; they may refer to *R. ferruginea*. The leaves in the type are densely dark glandular punctate beneath, this character not apparent in Stork and Horton specimen. F.M. Neg. 31986.

Cajamarca: Open shrubby woodland near Socota, 2,600 meters, *Stork & Horton 10087* (det. Standley). Cutervo, *Jelski 15; 19,* type collections. Chugur, 2,700 meters, *Weberbauer 4104;* 259. West of Huambos, *Weberbauer;* 260.—Ayacucho: Huanta, *Weberbauer 5649*.

—Cuzco: Yanamanche, *Weberbauer 4980; 4981* (both det. Mez); 244.—Puno: Near Yuncacoya, *Weberbauer 1083* (det. Mez); 242.

Rapanea latifolia (R. & P.) Mez, Pflanzenreich IV. 236: 387. 1902. *Cabalerria latifolia* R. & P. Syst. 279. 1798. *C. magnifolia* Pavón, ex DC. Prodr. 8: 102. 1844.

Stoutly branched but the petioles to 2 cm. long; leaves acute at base, broadly rounded at the obscurely acuminate tip, rarely rounded and minutely emarginate, sometimes 2 dm. long, 8 cm. wide or about 4 or mostly to 6.5 cm. wide, chartaceous to coriaceous, reticulate-veined, conspicuously and densely punctulate especially beneath but elineate; flower nodes stout, 5–8 mm. long, the umbelliform flowers (female) glabrous, 3 mm. long, the stout pedicels about as long; sepals one-third connate, in male flowers ciliolate, in female sparsely punctate, papillose, acute; petals a little more than one-third connate, acutish, subequaling the anthers, in male flowers puberulent; ovary globose, the stigma divided into 3 foliaceous lobes.—Most of the material determined by me as *R. leuconeura* which, as *R. umbellata* (Mart.) Mez, 384, is doubtfully in Peru, if distinct. Description of male flowers from *Stork & Horton 10145*, the calyx, petals and young fruits streaked with red marks, the leaves dark green, little lustrous, paler beneath, very minutely pellucid punctate and pitted. My collections from well-formed trees, to 10 meters tall; used for native huts (Mexia). F.M. Negs. 7850; 29510.

Cajamarca: Above Socota, 2,800 meters, *Stork & Horton 10145* (det. Standley).—San Martín: Tarapoto, *Williams 5461*. Lamas, *Williams 6383*.—Huánuco: Muña and Pillao, *Ruiz & Pavón*, type. Huánuco to Pampayacu, *Kanehira 242*. Yanano, *3753* (det. Killip, *R. oligophylla*); *3763*. Above Río Cayumba, *Mexia 8318* (det. Standley, *R. manglillo?*).—Junín: Chanchamayo, *Isern 2299; Schunke 323; 326*. La Merced, *Killip & Smith 23510*. San Ramón, *Killip & Smith 24789*. Colonia Perené, *Killip & Smith 25042*. Enenas, Pichis Trail, *Killip & Smith 25701* (toward *R. umbellata*, leaves rigid, emarginate).—Cuzco: Río Champinmayo, *Soukup 585*.—Río Acre: Seringal Auristella, *Ule 9690* (det. Mez). "Lucuma."

Rapanea Lechleri Mez, Pflanzenreich IV. 236: 380. 1902.

Branches stout, densely reddish tomentose; petioles to 5 mm. long; leaves oblong-elliptic, rounded broadly at base, narrowly at tip, about 5 cm. long, 1.5 cm. wide, rather rigid, midnerve on both sides tomentulose, otherwise glabrate and lustrous above, opaque and sparsely pilose beneath, densely reticulate, both surfaces with a few scattered punctae; flowers about 5 in glomerules, densely tomentose, apparently subsessile; sepals lineate, ciliate, rounded, very shortly connate as the similar petals, the somewhat shorter rotund anthers dorsally near tip with 1 long resiniferous gland.—Female flowers unknown.

Puno: Tatanara, (*Lechler 2647*, type).

Rapanea leuconeura (Mart.) Mez, Pflanzenreich IV. 236: 389. 1902. *Myrsine leuconeura* Mart. Herb. Fl. Bras. 256. 1837–40.

Glabrous, the branchlets usually stout; petioles 7 (–12) mm. long; leaves elliptic, shortly or long-acute at base, acutish or subacuminate, rarely obtusish or emarginate, about 11 cm. long, 4.5 cm. wide, chartaceous or coriaceous, more or less lustrous above where densely punctulate, very sparsely glandular lineate beneath, smooth except for the nerves or sometimes somewhat reticulate; flowers 6–12, 2.5–3 mm. long, capitellate, much shorter than the petioles, the pedicels less than 1 mm. long; sepals scarcely one-fourth connate, the acute or mucronulate lobes rarely ciliolate; petals nearly connate to middle, very acute, glandular-lineate, slightly longer than the acuminate anthers; ovary ellipsoid, the subsessile stigma cylindric-lobulate.—Included, as many Peruvian specimens were so determined by me; the species, as *R. umbellata* (Mart.) Mez, at least as to Peru, is doubtfully distinct from *R. latifolia,* as suggested by the repetition of the names in Mez' key. Illustrated, Mart. Fl. Bras. 10. *pl. 54*. F.M. Neg. 20076.

Peru (probably *R. latifolia,* at least as to Peru). To eastern Brazil.

Rapanea manglillo (Lam.) Mez, Pflanzenreich IV. 236: 383. 1902. *Sideroxylon manglillo* Lam. Encycl. 1: 245. 1783. *Duhamelia manglillo* Domb. ex Lam. l.c. 245. *Manglilla peruviana* J. F. Gmelin, Syst. 398. 1791. *Caballeria oblonga* R. & P. Syst. 280. 1798. *Myrsine erythroxyloides* Benth. Bot. Voy. Sulphur 123. 1844.

Glabrous, the branchlets stout, the petioles to 1 cm. long; leaves oblong-elliptic, shortly or barely acute at base, rounded at apex, to 9 cm. long, a third as broad, often smaller and somewhat wider proportionately, coriaceous, not obviously punctate, smooth both sides except for the slender suberect costae; flowering nodes even as long as petioles, 4–12-flowered, the pedicels to 6 mm. long; female flowers scarcely 5, male 6.5 mm. long, the sepals and petals both only shortly connate, elliptic, rounded at apex, the former crenulate-papillose, the latter sparsely and apically pictate; anthers acute, epunctate, included; stigma subglobose.—*Mexia 8318* and *Stork & Horton 9151* both have punctate leaves, those of the former 12–16×5, cuneate at base, the petioles winged, those of the latter merely acute at base, both determinations therefore open to question or the species is variable. To 11 meters high, the wood used for huts (Mexia). Common along rivers, ascending to 2,400 meters (Weberbauer). F.M. Neg. 26694.

Lima: Region of Lima, (*Barclay 235; Cuming 1031; Gaudichaud 146; Dombey*); *Martinet 43; Ruiz & Pavón,* type.—Ancash: Near Santa, with *Salix,* 4 meters high, *Stork & Horton 9151* (det. Johnston). Near Caraz, *Weberbauer 172.*—Huánuco: Forested slope, Río Cayumba, *Mexia 8318* (det. Standley, with query). "Lucuma," "manglillo."

Rapanea oligophylla (Zahlbr.) Mez, Pflanzenreich IV. 236: 392. 1902. *Myrsine oligophylla* Zahlbr. Ann. Naturh. Hofmus. Wien 7: 2. 1892.

Glabrous, the branchlets stout, the petioles about 1 cm. long; leaves oblong-elliptic, shortly or barely acute at base, obtusish, about 1 dm. long, 4 cm. wide, chartaceous, the many curved ascending nerves filiform, otherwise smooth, dark punctate beneath; flower nodes very stout, cylindric, to 2 cm. long, gradually shorter toward the branchlet tips with 10–16 flowers crowded-capitate, the pedicels even in fruit hardly 1 mm. long; flowers (female) 2 mm. long; sepals to one-third connate, the scale-like lobes acute, ciliolate, more or less punctulate; petals more than one-third connate, broadly elliptic, punctate except the margins; ovary globose, the stigma conical, acute.—Maybe the Weberbauer record from Cuzco was rather the perhaps not specifically distinct *R. rivularis;* determinations (as elsewhere), by Mez. F.M. Neg. 31987.

Cajamarca: Callacate, *Jelski 13,* type. Cutervo, *Jelski 364.*—Amazonas: South of Chachapoyas, *Weberbauer 4316; 4318.*—Junín: Near Palca, *Weberbauer 2148;* 247.—Cuzco: Prov. Convençion, *Weberbauer 4994; 4941;* 281.

Rapanea Pearcei Mez, Pflanzenreich IV. 236: 386. 1902.

Glabrous except the ciliate-tipped sepals; branchlets stout; leaves lanceolate, acute at base and strongly decurrent on the short petioles —these rarely longer than 3 mm.—narrowly rounded at apex, about 6.5 cm. long, 2 cm. wide, rigid, opaque, prominently reticulate on both sides, the younger resiniferous-lineate; flowers 4 mm. long, about 5 in small heads, the pedicels usually shorter than 2 mm.; sepals and petals epunctate, the former to one-fourth connate, rounded, the latter broadly connate, acute, inflexed at apex, slightly longer than the broadly elliptic subacute apically papillose epunctate anthers; ovary well developed in the male flowers (female unknown), the stigma narrowly conical.—The type locality (unless, perhaps, Huancayo) is not surely Peruvian. According to Herrera, a small tree.

Cuzco: Hacienda Pfuyucalla, Valle del Paucartambo, 3,400 meters, *Herrera 2977* (fide Herrera). Dept. unknown: Huagcani, 33–3600 meters, (*Pearce* in herb. Kew, type). "Lluthu-lluthu" (Herrera).

Rapanea pellucida (R. & P.) Mez, Pflanzenreich IV. 236: 394. 1902. *Caballeria pellucida* R. & P. Syst. 280. 1798.

Completely glabrous as to type even to the sepals, the branchlets moderately stout, the petioles about 7 mm. long; leaves narrowly elliptic-oblong, acute at base, rounded at apex, about 8 cm. long, 27 mm. wide, subcoriaceous, lustrous, against light some pellucid punctae and resiniferous lines apparent; flowers 6–12, glomerulate, 2.5 mm. long, the female sessile; sepals densely punctate, eciliate, medially connate, rounded; petals narrowly ligulate, to one-third connate, obscurely lineate; stigma lobate.—Type, female flowers as described; *Mexia 8100; 8095,* if belonging here (species probably a part of *R. manglillo*), may be described as follows: flowers all male (*8100*) or hermaphrodite; former umbelliform or short-racemose (the upper); pedicels 2–3 mm. long, glabrous; sepals nearly glabrous, petals rather conspicuously lineate pictate, high connate, 2.5 mm. long, subequaled by the anthers; leaves to 9×3 cm., rounded obtuse, slightly acute at base; veins laxly reticulate on both sides, sparsely or obscurely punctate beneath; petioles to 8 mm. long; hermaphrodite flowers on nodes 3–4 mm. long, pedicels 2–3 mm. long, leaves smaller 6×1.5 cm., oblong, otherwise like above. F.M. Neg. 8610.

Lima: Pachacamac, arid coastal plain, shrub nearly 2 meters high, *Mexia 8100* (male); *8095* (both det. Standley).—Huánuco: In woods near Muña, *Ruiz & Pavón,* type; *4020* (det. Killip). Pampayacu, *Sawada 27.*

Rapanea rivularis Mez, Bull. Herb. Boiss. sér. 2. 5: 536. 1905.

Glabrous 2-meter shrub with short stout spreading terete branchlets; petioles lightly canaliculate, about 8 mm. long; leaves narrowly elliptic, gradually acute to base, acutish or very narrowly rounded at apex, about 10 cm. long, 3 cm. wide, entire, coriaceous, opaque, paler beneath, the obscure veins not reticulate, manifest pellucid lines and dots lacking; inflorescence sessile, dense, not racemiform, 5–7-flowered; flowers (only female known) about 3 mm. broad, subsessile; sepals shortly connate, narrowly rounded at tip, scarcely ciliolate, epunctate, the similar but one-third connate petals densely punctate, the lanceolate-linear lobes recurved-spreading; reduced anthers epunctate, acute, much shorter than petals; ovary ovoid, not at all costate, glabrous.—Near *R. oligophylla* (Mez), but sepals not punctate.

Puno: Between Sandía and Tambo Azalayo, 1,500 meters, *Weberbauer 1061*, type; 278.

Rapanea sessiliflora Mez, Repert. Nov. Sp. 3: 103. 1906.

A glabrous shrub 2–3 meters high with terete squarrose stout branchlets and rigid elliptic leaves, acute at base and decurrent on petioles—these to 5 mm. long—broadly rounded at apex, about 5 cm. long, less than 2 cm. wide, entire, opaque or in life lustrous, pale reddish beneath with some scattered dark punctules but pellucid punctae and resiniferous lines lacking; inflorescence branchlets verruciform with about 5 capitulate flowers, these 5-merous, at anthesis sessile, the pedicels in fruit shorter than 0.5 mm.; flower greenish, 2.5 mm. wide, the rounded sepals nearly free, entire, scarcely papillose, sparsely punctate; petals entire, connate only at base, elliptic-rotund, not glandular, longer than the narrow-elliptic acute epunctate anthers; ovary globose, the stigma capitate; fruit somewhat punctate, 3 mm. thick.—Cf. *R. andina.* The allied *R. ovalifolia* (Miq.) Mez, 391, of eastern Brazil has obovate leaves, sepals and petals more connate, the latter lanceolate. F.M. Neg. 26699.

Cajamarca: Scattered shrubs, grass steppes above San Pablo, 2,400 meters, *Weberbauer 3810*, type; 256, 257. Between Huambos and Montan, 2,500 meters, *Weberbauer 4216; 4217.*—Amazonas: Cuelap, near Chachapoyas, *Weberbauer 4324.*—Huánuco: Mito, *1463* (det. Killip).

Rapanea Sprucei Mez, Pflanzenreich IV. 236: 388. 1902.

Glabrous with slender branchlets and 6 mm. long petioles, the leaves attenuate at base, rounded and often emarginate at tip, about 5 cm. long, 18 mm. wide, chartaceous-coriaceous, conspicuously and densely punctate, drying sordid brownish, the under surface reddish; nodes much shorter than the petioles, 3–5-flowered, capituliform, the pedicels obsolete or shorter than 1 mm.; flowers 2.5 mm. long; sepals basally connate, the acutish lobes eciliate but sparsely punctate; petals (female flowers) one-third connate, the lobes narrowly lanceolate, rounded apically and papillose marginally, pictate with many elongate punctae; drupe globose, about 3 mm. across, subsessile, densely marked with very thick lineate glands.—F.M. Neg. 26700.

San Martín: Tarapoto, *Spruce 4251*, type; *Williams 5977*. "Camesito" (Williams).

Rapanea Weberbaueri Mez, Repert. Nov. Sp. 3: 103. 1906.

Glabrous 3-meter shrub with squarrose terete branchlets and fleshy coriaceous broadly elliptic leaves, narrowed at base into the petioles, these lightly canaliculate, about 6 mm. long, narrowly rounded at tip, often 1 dm. long, 4.5 cm. wide, entire, dull, lineate-resiniferous but not pellucid-punctate, paler and dark glandular punctate beneath, the fine nerves prominent; flowers 5-merous, racemosely capitulate-umbellulate, the female 5–7, the male many, the pedicels scarcely 1 mm. long, the sepals basally connate, acute, marginally papillose, the male broadly ovate, the female narrower, both multi-punctate, the similar sublanceolate spreading petals less so; anthers elliptic, acute, included, in the female flowers reduced; ovary subglobose, not costate, the stigma capitate or slightly lobulate; fruit glandular punctate.—Resembles (according to author) *R. squarrosa* Mez, 390, of Brazil with much narrower leaves; cf. *R. latifolia*. F.M. Neg. 4895.

Huánuco: Near Monzón, *Weberbauer 3457* and *3462* (male and female, type); 284.

2. GRAMMADENIA Benth.

Glabrous entire-leaved shrubs that are much like *Cybianthus* but the flowers always 5-merous, generally hermaphrodite, and in the case of Peruvian species, the leaves are sessile and only 1 or 2 cm. wide. Petals never more than one-third connate, imbricate or dextrally convolute, spreading at anthesis. Stamens affixed to a fleshy ring in the corolla throat. Stigma truncate.

Leaves to 5 cm. long, 1 cm. wide, oblong or lanceolate.
  Racemes and leaves subequal, the latter without marginal nerve. *G. nitida.*
  Racemes much shorter than the leaves, the latter marginally nerved. *G. Weberbaueri.*
Leaves to 7 cm. long, 2 cm. wide, oblong-elliptic. . . . *G. asymmetrica.*

Grammadenia asymmetrica Mez, Bull. Herb. Boiss. sér. 2. 5: 246. 1905.

Glabrous epiphytic shrub with stout terete branchlets; leaves sessile, asymmetric, oblong-elliptic, about 7 cm. long, 2 cm. wide, gradually narrowed to base, acute, coriaceous, smooth except for midnerve and marginal nerve, more or less marked with elongate resiniferous lines; inflorescence many-flowered, to 5 cm. long, racemose, the fruiting pedicels to 2.75 mm. long; bracts much shorter; sepals lineate, dotted medially, subovate, ciliate; berry about 2 mm. thick, acute with persistent style and ornate with short lines.—Affine *G. marginata* Benth., 231, of Colombia. F.M. Neg. 4861.

Loreto: Cerro de Ponasa, 1,300 meters, *Ule 6792*, type.

Grammadenia nitida Mez, Pflanzenreich IV. 236: 232. 1902.

Branchlets stout, the densely crowded oblong leaves slightly narrowed at base, acutish and aristulate, about 3 cm. long, nearly 1 cm. wide, glabrous and smooth, shortly lineate, very vernicosely lustrous above; racemes lax, glabrous, little longer than the leaves; pedicels and bracts subequal, hardly 2 mm. long; flowers red, 5.5 mm. broad; sepals and petals to one-fourth connate, subovate, the former crenulate with a few lineate punctae, the latter entire and very obscurely lineate; anthers connate with episepalous bodies, sparsely punctate near base; ovary large, subglobose, the style very short.

Huánuco: Montaña of Pozuzo, 3,000 meters, (*Pearce 253*, type).

Grammadenia Weberbaueri Mez, Repert. Nov. Sp. 16: 418. 1920.

Glabrous except for the crenulate-ciliolate sepals; leaves sessile, crowded at the tips of the very stout branchlets, lanceolate, narrowly rounded at the mucronate tip, to 4.5 cm. long, 1 cm. wide, rigid, dull, scattered dark punctate beneath with prominent marginal nerve, the margin, especially toward the base, crispulate; racemes erect, to 10-flowered, much shorter than the leaves, the pedicels a little longer than the punctate bracts; flowers rubescent, 1.5 mm. long, the sepals shortly connate, ovate, acutish, lineate-punctulate as the petals, these barely connate at base, suborbicular, obtuse or emarginate; filaments connate, the large episepalous bodies or lobules connate, unilineolate dorsally; ovary depressed globose, the style short, thick. —The type was 3 meters tall.

Cajamarca: Mountains of Huancabamba, *Weberbauer 6121*, type. Near Querocotillo, Prov. Cutervo, *Weberbauer 7168* (det. Mansfeld).

3. CYBIANTHUS Mart.

Shrubs or trees, the leaves rather remote or often somewhat verticillate, entire or rarely crenulate, the flowers small or minute in lateral, usually simple racemes, white, greenish or purplish, pedicelled, the bracts inconspicuous, caducous. Flowers variable, as in *Ardisia* but the imbricate aestivation of petals often nearly valvate (rarely dextrally convolute) and always 4-merous, and stamens often affixed to the throat of the corolla, the anthers basifixed and usually as broad or broader than long, commonly dehiscing by pores or if by clefts these short. Style shorter than the ovary, the stigma lobulate; placentae few-ovuled, 1-seriate.—The generic name has been conserved against *Peckia*.

Inflorescence paniculate; leaves somewhat undulate-crenulate. *C. Poeppigii.*

Inflorescence racemose or subspicate; leaves entire unless *C. psychotriifolius.*

  Anthers sessile (unknown in *C. resinosus*, only species with obviously ciliate-crenulate sepals).

    Leaves opaque, sparsely lepidote beneath; racemes short; petals about one-third connate, little punctate. . . *C. minutiflorus.*

    Leaves lustrous, glabrous in age; racemes often long; petals medially connate, punctate. . . . . *C. macrophyllus.*

  Anthers subequaled by filaments; leaves opaque.

    Leaves in age glabrous or glabrate, often much longer than racemes. . . . . *C. psychotriifolius.*

    Leaves slightly lepidote beneath, little longer than racemes. *C. cyclopetalus.*

Cybianthus cyclopetalus Mez, Herb. Boiss. Bull. sér. 2. 5: 533. 1905.

Slender branchlets and leaves beneath with some scattered lepidote indument; petioles about 2 cm. long, slightly canaliculate; leaves elliptic or obovate-elliptic, gradually acute and decurrent on petioles, elegantly acuminate, about 1.5 dm. long, a third as wide, chartaceous opaque, scattered puncticulate above especially toward margins; racemes lax, little shorter than leaves, ferrugineous lepidote; pedicels slender, to 4 mm. long or twice as long as the linear bracts; flowers yellowish-green, attaining 6 mm. in diameter; sepals narrowly triangular, acute, ciliate, densely punctate, nearly free;

petals medially connate, the lobes suborbicular, densely punctate; anthers punctate, ovate-elliptic, rounded apically, the manifest filaments inserted high on petals; glabrous ovary of male flowers much reduced.—Apparently part of the *C. macrophyllus* complex, as suggested by the author, who allies it also to his *C. venezuelanus.* F.M. Neg. 4863.

Loreto: Mishuyacu, *Klug 285; 367.* Brazil.

Cybianthus macrophyllus Miq. in Mart. Fl. Bras. 10: 292. *pl. 36.* 1856; 221.

Branchlets apically densely appressed rusty tomentulose; petioles about 2 cm. long; leaves elliptic or elliptic lanceolate, acute both ends or subacuminate, about 2.5 dm. long, 9 cm. wide, chartaceous, lustrous above, the mature glabrous both sides, densely reticulate and puncticulate; racemes pendulous, slender, curved, rather shorter than the leaves, sparsely scurfy; pedicels slender, 1–1.5 mm. long; flowers 4 mm. broad; sepals ovate-elliptic, narrowly rounded apically, fimbriolate, strongly punctate as the ovate-triangular acuminate(?) petal lobes, these connate to the middle; anthers sessile in throat, introrsely dehiscent; ovary glabrous; stigma pulvinate, very obscurely lobed.—*C. venezuelanus* Mez, l.c., is distinguished, according to the author, particularly by the rounded petals; *C. egensis* Mez, 222, by the sepals and petals less than one-third connate, the former acute, the latter suborbicular; these differences are open to question; certainly the petals are not acuminate in the Poeppig type number, rather acute or obtusish.

Loreto: Mishuyacu near Iquitos, *Klug 94; 1384.* Pumayacu, *Klug 3188* (det. Standley). Brazil.

Cybianthus minutiflorus Mez, Repert. Nov. Sp. 3: 102. 1906.

Sparsely branched (as to type), the branchlets and short dense racemes appressed rusty lepidote; petioles enlarged at base, deeply grooved above, to 3 cm. long; leaves obovate, cuneately acute at base, acuminate, to 2.5 dm. long, 8 cm. wide, chartaceous, dull, glabrate, but scattered dark punctate and brown lepidote; bracts caducous; pedicels scarcely 0.5 mm. long; flowers (female) greenish, 3.5 mm. wide, 5- or 6-merous; sepals nearly free, ovate, acute, punctate; petals scattered punctate, a little more than one-third connate, the elliptic lobes broadly rounded; anthers with a dark zone, minute, sessile, inserted high in the corolla throat; ovary glabrous, three times longer than the stout style; fruit red, globose, on pedicels 2 mm.

long.—Allied to *C. egensis* Mez, 222, with anthers inserted near base of corolla. Type 3 meters high; seems to be scarcely distinguishable from *C. macrophyllus* Miq. F.M. Neg. 4867.

San Martín: Near Rioja, 900 meters, *Weberbauer 4699*, type; 290. Chazuta, *Klug 3981* (det. Standley, *C. cyclopetalus*).

Cybianthus Poeppigii Mez, Pflanzenreich IV. 236: 218. 1902.

Tree or shrub, the slender branchlets minutely appressed rusty tomentose toward the tips; petioles about 1 cm. long; leaves lanceolate-elliptic, narrowly cuneate at base, long-acuminate, about 1.5 dm. long, 4 cm. wide, with a few rounded teeth (scarcely more than undulations) near the apex, slightly lustrous, glabrous in age or very sparsely and minutely lepidote, prominently reticulate both sides and beneath more or less punctate; inflorescence paniculate, lax, shorter than the leaves, spreading-puberulent, the pedicels slender, 3 mm. long; flowers nearly 5 mm. wide, the sepals coarsely crenate, marginally glabrous, elliptic-lingulate, sparsely punctate as the nearly free ovate rounded crenulate petals; anthers not quite sessile, scarcely punctate; ovary sparsely lepidote, the short style with digitately lobed stigma.—Flowers imperfectly known. May be a part of *C. penduliflorus* Mart., 217, with sessile anthers, pedicels to 2 mm. long, less acuminate entire leaves (as to type). The other known species with obscurely undulate-crenulate leaves is *C. psychotriifolius* Rusby ex Mez, 227, of Bolivia and Brazil, with filaments as long as or longer than anthers, ciliolate sepals. F.M. Neg. 31998.

San Martín: Tocache, in thick forest, *Poeppig*, type.

Cybianthus psychotriifolius Rusby ex Mez, Pflanzenreich IV. 236: 227. 1902. *Peckia psychotriaefolia* Rusby, Mem. Torrey Bot. Club 6: 75. 1896.

Branchlets stout—about 5 mm. thick—reddish puberulent toward the tips as the solitary or 2–3 axillary racemes, these about erect, rather densely flowered, 6–10 cm. long; petioles about 1.5 cm. long; leaves elliptic-obovate, cuneately decurrent into the petioles, subabruptly acuminate, often at least 2 dm. long, nearly half as wide, chartaceous, opaque, glabrous above, obscurely (if at all) lepidote in age beneath but rather prominently nervose and laxly reticulate-veined; petioles about 2 mm. long; flowers to 5 mm. across, the sepals acutish, ciliolate, sparsely pictate, the shortly coalescent broadly rounded petals minutely puncticulate; filaments about as long as subrectangular emarginate sulcate anthers (sometimes longer?);

ovary stout, brown lepidote, the short thick style with slightly lobulate stigma.—To be expected within adjacent Peru; near *C. macrophyllus*, and its validity (as that of other forms) seems to depend on the significance (if any) of the relative development of filaments and petal connation.

Río Acre: Near mouth of Río Macauhán, *Krukoff 5753*. Bolivia; Brazil.

Cybianthus resinosus Mez, Pflanzenreich IV. 236: 219. 1902.

Branchlets reddish tomentulose toward tips; petioles about 13 mm. long; leaves narrowly elliptic, cuneately acute at base, elegantly and acutely acuminate, to 2 dm. long or longer, 6 cm. wide, entire, membranous, lustrous, glabrous except for the minutely lepidote principal nerves beneath, strongly and densely reticulate both sides, not at all manifestly punctate; inflorescences much shorter than the leaves, dense, slender, more or less erect, puberulent, subspicate, the pedicels shorter than 1 mm.; drupes globose, smooth, about 5 mm. in diameter, the sepals at most one-third connate, broadly ovate-elliptic, rounded, coarsely crenate, closely ciliate and with many small punctae.—The Amazonian *C. nitidus* Miq., 219, seemingly is similar but its sepals are merely ciliolate; unfortunately the petals and stamens of *C. resinosus* are unknown; it may prove to be a part of *C. nitidus*.

Loreto: In woods at Yurimaguas, *Poeppig 2428*, type; *Killip & Smith 28110*. Iquitos, *Williams 3676?* (young).

4. WEIGELTIA A. DC.

Glabrous or slightly and minutely lepidote (apparently rarely puberulent) shrubs or small trees, the leaves usually rather remote, exceptionally crowded and pseudoverticillate, either entire or serrate. Flowers pedicellate in axillary ordinarily more or less pendent panicles, normally 4- (3–5-) merous and dioecious, the sepals and petals both usually imbricate, rarely dextrally convolute and medially connate. Filaments always well developed, the anthers never longer than broad, rarely acutish, longitudinally dehiscent. Ovary usually glabrous, the stigma of the obvious style often lobed. Fruit globose, crustaceous, 1-seeded.—Named for Weigelt, who collected the first species in Dutch Guiana.

Besides the following, *Klug 2691* from Pongo de Cainarachi, San Martín, may be *W. Goudotiana* Mez, 290, of Colombia, with bipinnate inflorescence; the specimen seen, however, has undeveloped flowers, apparently only male.

Pedicels 2 mm. long; petals obtuse................*W. nanayensis.*
Pedicels 1–1.5 mm. long; petals acute................*W. silvestris.*

Weigeltia nanayensis Macbr. Field Mus. Bot. 11: 33. 1931.

Small shrub, the branchlets glabrous except the minutely and sparsely rufous lepidote tips; petioles 1.5–2 cm. long; leaves elliptic-lanceolate, gradually attenuate to base, mostly acuminate, about 1.5 dm. long, a third as broad, chartaceous, rather prominently reticulate both sides; punctules few, scarcely obvious beneath; racemes densely flowered, about 2 cm. long; bracts longer than the pedicels, these 2 mm. long; flowers 4-merous, scarcely 2.5 mm. broad; calyx lobes ovate, acute, more or less black punctate as also the twice as long obtuse petals, these about equaled by the high-inserted slender filaments, the subrotund not at all emarginate or punctulate anthers medially affixed dorsally.—*Williams 657,* in bud, has leaves to 6.5 cm. wide, erect racemes 5 cm. long, and may rather be *Cybianthus resinosus.* The species is rather aberrant but its regularly lobed calyx and its roundish dorsally affixed anthers seem to place it in this genus. Otherwise it resembles *Cybianthus psychotriifolius* Rusby, 227, but with firmer leaves. The genera seem to be similar. In the Colombian *W. Schlimii* (Hook. f.) Mez, 291, the sepals and petals are broadly rounded and only 3.

Loreto: Lower Río Nanay, *Williams 658,* type; *657*(?).

Weigeltia silvestris Macbr. Candollea 6: 16. 1934.

A simple little shrub 6 dm. high, the young branchlets sparsely puberulent; leaves elliptic or oblong-elliptic, the base attenuate into a petiole 10–12 mm. long, the apex acuminate, 1.5–2 dm. long, 5–10 cm. wide, entire, papyraceous, olivaceous, paler beneath where, especially, strongly reticulate-veined, obscurely and scattered punctate, glabrous; inflorescence axillary, narrowly paniculate or racemose, minutely and sparsely granulate-pulverulent, 5–10 cm. long, the remote 4-merous flowers 3–3.5 mm. broad; bracts rather persisting, subulate, 2 mm. long; pedicels 1–1.5 mm. long; sepals and petals to one-fourth connate, entire, prominently punctate, the former acuminate, about 1 mm. long, the latter elliptic-oblong, acutish, nearly twice as long; anthers exserted, subglobose, dehiscent by long clefts, dorsally affixed.—Suggests *W. simplex* (Hook. f.) Mez, 290, of Ecuador, with more compound inflorescence, pedicels 4–10 mm. long, scarcely connate sepals, few-punctate petals narrowed above, but the petals of our species have nearly the form that characterizes the subgenus *Euweigeltia*. Flowers in type cream-color, brown and smaller in the other collections. *W. longifolia* Benth., 285, of Brazil, has acutish sepals which with petals are obscurely or sparsely punctate. Other species with acute petals are *W. Sprucei* (Hook. f.) Mez and *W. humilis* Mez, both 291, the former of Ecuador, the latter, Colombia. Both have slender pedicels 2–4 mm. long and resemble *W. simplex* but the flowers are 5-merous, the stamens in the former joined with petals below, in the latter the filaments free, slender. None of the material referred here has been seen since the species was proposed.

Loreto: Mishuyacu, *Klug 724*, type; *304; 1355.*

5. **ARDISIA** Swartz

Shrubs or sometimes trees with alternate, usually petioled, often serrate or crenate leaves and commonly hermaphrodite small white or roseate pedicellate (rarely sessile) 4- or 5-merous flowers that are generally arranged in paniculate racemes or pseudo-umbels, these terminal or axillary. Sepals and petals dextrally convolute or often imbricate (American species), usually free, or the petals even medially connate. Stamens most frequently affixed near base of corolla, the filaments obvious (American), sometimes coalescent into a tube. Anthers short-ovate or elongate-sagittate, usually acute, dorsally or basally affixed. Ovary superior, the style long, the stigma minute; ovules many (sometimes only 5) in several series. Fruit globose, baccate, 1-seeded.

Stamens longer than petals, filaments coalescent; leaves densely reticulate-venose............................*A. venosissima.*

Stamens rarely as long as petals, free; leaves laxly or obscurely reticulate-venose.

  Leaves entire or obscurely crenulate.

    Panicles in flower much exceeding leaves; buds conspicuously bracted....................................*A. esculenta.*

    Panicles in flower shorter than leaves; buds and bracts subequal or latter minute.

      Leaves scarcely 2.5 cm. wide, sparsely lepidote. .*A. huallagae.*

      Leaves to 4 cm. wide or wider, glabrous.

        Bracts large, caducous; sepals 5, punctate as petals.

Leaves chartaceous, drying pale green. . . . *A. nigrovirens.*
Leaves coriaceous, often drying dark. . . . . . *A. albovirens.*
Bracts minute; sepals 4 (usually), sparsely punctate, the petals not or somewhat lineate. . . . . *A. panurensis.*
Leaves obviously crenulate at least toward tip.
Flowers 4-merous (mostly, as to type); leaves often sparsely lepidote beneath, usually 1 cm. wide or wider. *A. guyanensis.*
Flowers 5-merous (type); leaves to about 3 cm. wide, glabrous. *A. Weberbaueri.*

Ardisia albovirens Mez, Repert. Sp. Nov. 16: 311. 1920.

Completely glabrous, the type a low shrub with stout terete branchlets; petioles 8–15 mm. long, broadened above into the cuneately based elliptic-obovate leaves, these shortly and obtusely acuminate, 14–25 cm. long, 6–7.5 cm. wide, fleshy rigid, dull, venose beneath, densely lucid punctate and rather conspicuously lineate; panicle branched, to 7.5 cm. long, 5.5 cm. wide or larger; pedicels in type to 2 mm. long or apparently sometimes much shorter if not obsolete; flowers nodding at anthesis, whitish-green, to 6 mm. long, the sepals as to type nearly free, ovate, broadly rounded, glabrous or a little ciliate at tip, densely punctate as the petals, these one-fourth connate, broadly ligulate, not revolute, somewhat longer than the stamens; filaments and anthers subequal, the latter triangular and narrowed to the obscurely emarginate tip, dorsifixed slightly above the base; ovary ovoid, glabrous, the slender style with minute obtuse stigma.—*Mexia 8261* was from a slender tree 7 meters high with obovate leaves to 16 cm. long, 7 cm. wide, obsolete pedicels, sepals one-fifth to one-half united, the free portion 1 mm. long or longer and with 3 or 4 punctae, the black densely punctate fruit 4 mm. thick; as suggested by Standley, the determination seems doubtful. Species, fide Mez, near his *A. Brongniartii* l.c. 79, origin unknown. F.M. Neg. 4876.

Huánuco: Mouth of Río Cayumba, 860 meters, *Mexia 8261* (with query, Standley).—Río Acre: Xapury, *Ule 9682*, type. Brazil?

Ardisia esculenta Pavón ex DC. Trans. Linn. Soc. 17: 128. 1834; 84.

Leaves ovate-oblong, narrowed into the margined petioles, subacute, 7–10 cm. long, 2.5–3.5 cm. wide, entire, coriaceous, glabrous; panicles terminal, lax, longer than the leaves, the peduncles subvelvety, the bracts ovate, 6–12 mm. long, obtusish, subtending the erect sessile buds or young flowers; calyx lobes 2–3 mm. long, slightly ciliolate, unequal, ovate, acute; corolla in bud obtuse, 5-parted, the ovate glabrous lobes punctate; anthers rigid, erect, acuminate, bilobed at base; ovary ovoid-globose, the style acuminate.—Description after DeCandolle, the specimen not seen by Mez; perhaps not *Ardisia* and possibly Mexican; its appearance is aberrant. F.M. Neg. 2665.

Peru (very doubtful): Without data, *Pavón*, type, herb. Delessert (formerly herb. Moricand).

Ardisia guyanensis (Aublet) Mez in Urban, Symb. Ant. 2: 392. 1901; 94. *Icacorea guyanensis* Aublet, Hist. Pl. Guyan. 2. Suppl. 1. *pl. 368.* 1775.

Branchlets and petioles (to 1 cm. long) slender, the younger very closely appressed rusty lepidote, the leaves similarly but beneath very sparsely; leaves oblong-elliptic, narrowly decurrent from the acute base, acute or shortly acuminate, about 11 cm. long, 4 cm. wide, chartaceous, slightly lustrous, crenate, prominently nerved beneath, finely reticulate and more or less obscurely papillate; inflorescence terminal and axillary, much shorter than the leaves, the spreading branches nearly glabrous, the slender pedicels to 7 mm. long; flowers glabrous, mostly 4-merous, before anthesis 4 mm. long; sepals nearly free, ovate (in Peru, narrowly), membranous, little punctate, often minutely crenulate apically; petals lineate-pictate, connate only at base, narrowly elliptic, asymmetric, equaled by the style, nearly by the stamens; anthers concolor (black), epunctate, linear, basally affixed; ovary ovoid; fruit globose, about 6 mm. thick, blackish.—Species variable or the following not correctly determined. The fruiting Peruvian material cited seems always to have 5 sepals as *A. compressa* HBK., 89 (ranging north and east from Ecuador), which, however, has glabrous leaves. The normally 4-merous *A. semicrenata* Mart., 93, has densely punctate sepals, as the Killip and Smith specimens, but broadly ovate, as in the 5-merous specimen of Klug.

Amazonas: Chachapoyas, (*Mathews 1615*, det. Mez).—San Martín: Chazuta, *Klug 3978* (det. Standley).—Loreto: Soledad, *Killip & Smith 26735; 29566; 29614; 29724.* To Trinidad.

Ardisia huallagae Mez, Pflanzenreich IV. 236: 95. 1902.

Branchlets appressed rusty puberulent toward tips; petioles wing-margined, about 4 mm. long; leaves lanceolate, acute both ends or apically acuminate, about 7 cm. long, 23 mm. wide, glabrous and somewhat lustrous above, reddish, dull and sparsely lepidote beneath, chartaceous, entire, marked with many dark punctae; inflorescence pinnately paniculate, few-flowered, early densely lepidote with large scales, much shorter than the leaves, the slender pedicels about 3 mm. long; flowers glabrous, mostly 4-merous, before anthesis 4 mm. long; sepals submembranous, ovate acute, crenate and ornate with short dark lines and brown punctae; petals nearly free, the narrowly elliptic lobes obliquely acutish and longer than the stamens, these with dark linear basifixed anthers dehiscing apically from dilated clefts, the concolored back epunctate; ovary ovoid, the style filiform.—*A. panurensis* Mez, l.c., similar, has ciliate sepals, stamens little shorter than the elineate petals. F.M. Neg. 22949.

Peru(?): At the waterfalls of the Huallaga, *Spruce 4168,* type.

Ardisia nigrovirens Macbr. Candollea 5: 397. 1934.

Similar to *A. albovirens* Mez; leaves to 2.5 dm. long, 8 cm. wide, membranous or finally chartaceous, densely black-punctate, drying pale green; veins slender, obscurely reticulate; sepals little connate, elliptic-rotund, more or less black punctate; fruit globose, moderately black-dotted, about 6 cm. across.—Compared with the similar species, the much thinner leaves are so black punctate that against light they appear to be greenish-black; on the herbarium sheet, however, they are pale green while those of *A. albovirens* are blackish.

Loreto: Puerto Arturo, *Williams 5081,* type; *Killip & Smith 27743.*

Ardisia panurensis Mez, Pflanzenreich IV. 236: 95. 1902.

Glabrous shrub, the branchlets slender; petioles about 1 cm. long; leaves entire, elliptic, acute at base, elegantly slender-acuminate, 14 cm. long, 5.5 cm. wide, more or less, the veins and reticulate veins prominent both sides, the former arcuately joined before the entire margin, chartaceous, drying dark, not obviously punctate; inflorescence terminal, few-flowered, laxly corymbose and 3-pinnately paniculate, much shorter than the leaves, the pedicels around 3 mm. long; flowers all or mostly 4-merous, 3.5 mm. long before anthesis; sepals ovate, rounded, in type ciliate and with a few brown punctae; petals not at all lineate, broadly linear-elliptic, asymmetric; stamens little shorter than petals, anthers long, gradually acute, not punctate, twice exceeding filaments; ovary undeveloped; female flower unknown.—Species apparently weakly defined or the Río Acre specimen is incorrectly named; its somewhat crenulate leaves (about

9×4 cm.) are shortly and obtusely acuminate; it approaches *A. guyanensis*, as most of the Peruvian material, with glabrous sepals, often lineate petals, but the leaves are entire. F.M. Negs. 4880 (*Ule*); 26667.

San Martín: Zepelacio, *Klug 3338; 3527* (both det. Standley).—Huánuco: Tingo María, *Stork & Horton 9541* (det. Standley, *Conomorpha Weberbaueri*).—Río Acre: Seringal San Francisco, *Ule 9685* (det. Mez!). Amazonian Brazil; Colombia.

Ardisia venosissima (R. & P.) Macbr., comb. nov. *Caballerra venosissima* R. & P. Syst. 282. 1798. *Myrsine venosissima* (R. & P.) Spreng. Syst. 1: 664. 1825. *A. breviflora* A. DC. Prodr. 8: 122. 1844; 77.

Branchlets stout, the tips as the few-flowered subcorymbose inflorescences—these shorter than the leaves—somewhat puberulent; petioles about 5 mm. long; leaves acutely narrowed at base, subobtusely acuminate, commonly 9 cm. long, 4 cm. wide, chartaceous, glabrous, lustrous, closely nerved and conspicuously reticulate both sides and with many prominent pustules; pedicels longer than the ovate bracts, at anthesis to 3 mm. long; flowers to 4 mm. long, the sepals and petals both medially connate, the former scurfy ciliolate, the latter with revolute ligulate broadly rounded lobes, very minutely ciliolate apically; anthers narrowly ovate, subacute, concolor, exserted by the scarcely longer filaments, the style nearly as long as the petals; ovary subglobose.—My collection in fruit has leaves 6–7 cm. long, 3 cm. wide, and is smaller. Werdermann's suggestion in Herb. Madrid that the name of Ruíz and Pavón and that of A. DC. refer to the same shrub is certainly correct. The species is aberrant here in stamen character and points up the intransigeance of the generic boundaries assigned by botanists. F.M. Negs. 8524; 29508.

Amazonas: Chachapoyas, *Mathews*.—Huánuco: Muña, *3908; Ruíz & Pavón*, type; also Pillao to Chacahuasi.

Ardisia Weberbaueri Mez, Repert. Nov. Sp. 3: 97. 1906.

Completely glabrous shrub with slender tortuous terete branchlets; leaves elliptic-lanceolate, narrowed to both ends, decurrent on the petioles (these about 8 mm. long), chartaceous, smooth, densely dark lineate beneath, the lines short, the margins especially toward the acuminate tips crenulate, about 9 cm. long and a third as broad; inflorescence terminal, laxly subcorymbose, much shorter than the leaves, the branchlets with 3–7 umbellate flowers; bracts minute, caducous; pedicels elongate; flowers (little known) suberect, pale purple, 5-merous; sepals 4 mm. long, nearly free, rounded or minutely emarginate, submembranous, with many short punctae; petals similar, scarcely twice as long; stamens unknown; ovary glabrous, subglobose, the elongate style with punctiform stigma.—Allied, according to the author, to *A. poypoyanensis* Mez, 89, leaves lepidote beneath; but see *A. guyanensis;* there are either more species than described or fewer and these variable, as seems probable. Type was 1 meter high.

Junín: Near La Merced, 1,000 meters, *Weberbauer 1809*, type; 282.—Loreto: Mouth of Río Santiago, *Mexia 6153* (det. Standley, *A. guyanensis*).

6. PARATHESIS (A. DC.) Hook. f.

Similar to *Ardisia* but the flowers said always to be 5-merous, the corolla rotate with narrow more or less pubescent valvate lobes and the placentae with few ovules in one series. Stamens sometimes in the throat, the filaments usually filiform, the anthers sagittate-lanceolate.—In view of the variation in number of ovules (even as few as 5) and series in *Ardisia*, the character has probably been overstressed in the classification of the family.

Inflorescence terminal; leaves crenulate, often tomentose beneath. *P. amazonica.*

Inflorescence axillary; leaves entire or nearly, glabrate or glabrous.

  Sepals lineate; ovary and style pilose............*P. Candolleana.*

  Sepals elineate; ovary and style lepidote.........*P. adenanthera.*

Parathesis adenanthera (Miq.) Hook. f. in Benth. & Hook. f. Gen. Pl. 2: 645. 1876; 179. *Ardisia adenanthera* Miq. in Mart. Fl. Bras. 10: 285. 1856.

Branchlets apically as the young leaves densely rusty lepidote tomentose; petioles 15 mm. long; leaves elliptic, acuminate both ends, obscurely undulate-crenate, 18 cm. long, 7 cm. wide, thin-membranous, finally obscurely appressed-lepidote beneath, the nerves alternately thick and slender, strongly arcuate marginally and with many punctules and lines; panicles many-flowered, lax, equaling or exceeding the leaves, minutely puberulent; pedicels to 7 mm. long, the bracts minute; flowers 6 mm. long, tomentulose; sepals and petals nearly free, the former nearly linear, obtusish, coriaceous, epunctate, marginally papillose, the latter strongly so within, tomentulose without, long-lanceolate; stamens much shorter than the petals, the filaments pilose, the anthers acuminate, often punctate; ovary ovoid, the style slender.—F.M. Neg. 31994.

Huánuco: In thick wet woods, Cuchero, *Poeppig 1529*, type; *1667*.

Parathesis amazonica Mez, Repert. Nov. Sp. 16: 416. 1920.

Branchlets terete and with the petioles (these to 2 cm. long), leaves beneath and terminal lax pyramidal panicles at least early densely appressed tomentulose with rusty red trichomes that are especially developed on the obscurely or scarcely punctate lower leaf-surfaces; leaves elliptic, cuneately acute at base, shortly but elegantly acuminate, to 18 cm. long, a third as wide, minutely and densely crenulate, chartaceous, glabrous and nearly smooth above; bracts and bractlets persisting; pedicels slender, to 6 mm. long; flowers purplish, not attaining 5 mm. before anthesis, the sepals connate scarcely more than one-third, densely rusty tomentulose dorsally, ovate, acute, pale-lineate; petals connate at base, the much shorter stamens with thick filaments; ovate acute anthers, dark glandular at insertion; ovary glabrous, subglobose, the elongate style with punctiform stigma.—F.M. Neg. 4872.

Río Acre: Seringal de San Francisco, *Ule 9686*, type.

Parathesis Candolleana Mez, Pflanzenreich IV. 236: 179. 1902.

Resembles *P. adenanthera* but merely puberulent, the leaves glabrous, the sepals tomentulose marginally and minutely lineolate, the filaments only a little longer than the anthers.—A 5-meter shrub, the fruit black (Mexia), deep red or scarlet (in my collections; perhaps immature). The Mexia specimen is sparsely and minutely puberulent on the veins beneath, with branched trichomes, fruit about 1 cm. thick. *P. macrophylla* Rusby, 180, Bolivian, has glabrous filaments, the sepals punctulate.

Huánuco: Mouth of Río Cayumba, in forest, 860 meters, *Mexia 8286* (det. Standley).—Junín: Río Paucartambo Valley, *Killip & Smith 25392.* Chanchamayo Valley, 700 meters, *Weberbauer 1881* (det. Mez); 282. Hacienda Schunke, *5604.* La Merced, *5519.*

7. GEISSANTHUS Hook. f.

Shrubs or trees, the petioled leaves relatively few for the family, often crenate, the 5-merous flowers in terminal panicled or rarely subcorymbose racemes or spikes. Sepals at first closed unless at apex, at anthesis rupturing into 2–8, usually 3–6, regular or irregular segments. Petals high-connate, valvate or imbricate, recurved at anthesis. Stamens short or often exceeding the petals, the usually long filaments affixed near the corolla base, the versatile ovate acute or mucronulate anthers introrsely dehiscent by two long clefts. Ovary glabrous, the short style with apiculate or conical stigma. Fruit drupaceous, 1-seeded.—Notwithstanding Mez' feeling that this is "an extremely natural genus" the affinity with *Stylogyne* and with species of *Conomorpha* with compound inflorescence seems to be very great, especially since the calyx character is intangible or only in bud determinable. But maybe it should be limited to original species. The earlier name is *Dicaryum* Willd., based on a single Colombian species, and apparently the name is not preoccupied.

Leaves acute or acuminate; petals not cucullate-inflexed.
  Stamens about as long as the imbricate petals. . . . . *G. Haenkeanus.*
  Stamens clearly shorter than the valvate petals. . . . *G. peruvianus.*
Leaves obtuse or rounded at tip; petals cucullate at apex.
G. dentatus.

Geissanthus dentatus (R. & P.) Macbr., comb. nov. *Caballeria dentata* R. & P. Syst. Veg. 281. 1798. *G. obtusus* Mez, Repert. Nov. Sp. 16: 419. 1920. *G. Karlii* Macbr. Candollea 5: 395. 1934.

Branchlets stout, glabrous, somewhat angled, obtusely toward the tips; petioles to 15 mm. long; leaves obovate, not at all decurrent at the obtuse base, rounded at apex or obscurely cuspidate-acuminate from the rounded tip, to 13 cm. long, 5.5 cm. wide, the margins undulate-calloused-crenate, coriaceous, obscurely punctulate, dull, glabrous and nearly veinless above, conspicuously reticulate-veined and only under a lens obscurely pulverulent beneath; inflorescence subcorymbose, squarrosely branched, shorter than or as long as the leaves, appressed rusty puberulent, the pedicels about 1 mm. long or longer; flowers glabrous, before anthesis 4 mm. long, the sepals membranous, with 4–5 irregular segments that are not at all pictate as also the lightly imbricate petals, these to one-third connate, narrowly elliptic, acute and cucullately inflexed; stamens slightly exserted, the ovate-elliptic anthers much shorter than the long filaments; ovary ovoid with cylindric style, conic stigma.—Loesener, Notizbl. Bot. Gart. Berlin 11: 96. 1931, called attention to Mez' error, Monogr. 396, in suggesting that this could be a species of *Ilex;* Werdermann in Herb. Madrid referred the type to *G. obtusus* and it seems in order to take up the name of Ruíz & Pavón, since it is available.

I named this species for my talented friend Karl Schulz-Korth, overlooking Mez' description; see Mattfeld, Verh. Bot. Ver. Brandenb. 73: 141–152. 1931, for an interesting account of the short life of this exceptional personality, who contributed unselfishly to my work at Dahlem.

Piura: Above Shumaya in a side valley of the Huancabamba, *Weberbauer 6288* (type, both *G. obtusus, G. Karlii*). Without locality, *Ruiz & Pavón,* type.

Geissanthus Haenkeanus Mez, Pflanzenreich IV. 236: 236. 1902.

Branchlets stout, the younger closely appressed rusty tomentose as also the multi-flowered paniculate inflorescences, these shorter than the glabrous leaves, their subsessile flowers borne in crowded branchlets; petioles to 1 cm. long, winged by the decurrent oblong-obovate acute leaves, these subcoriaceous, somewhat lustrous, about 1.5 dm. long, 4 cm. wide; flowers fleshy, glabrous, 4 mm. long before anthesis; sepals connate above the middle, the well-punctate ovate irregular lobes now acutish, now rounded; petals more than one-third connate, the elliptic acutish lobes imbricate; stamens subequaling the petals, the narrowly ovate acutish concolored anthers epunctate, medially affixed; ovary ellipsoid, subequaled by the style, the stigma obtuse or subpulvinate.—The sepals and petals are both punctate or short lineate with dark-colored glands. Perhaps erroneously, Mez included in the description Bolivian material with apically rounded leaves. F.M. Neg. 20061.

Huánuco: Muña, *Haenke,* type; *Ruiz & Pavón.* Sariapampa, *Woytkowski 34310* (distr. as *G. andinus* Mez, vel aff.). Bolivia?

Geissanthus peruvianus (A. DC.) Mez, Pflanzenreich IV. 236. 238. 1902. *Badula peruviana* A. DC. Prodr. 8: 111. 1844. *Parathesis peruviana* (A. DC.) Pax in Engler, Pflanzenf. 4, Abt. 1: 93, fig. D. 1889. *Ardisia peruviana* (A. DC.) Miq. in Mart. Fl. Bras. 10: 290. 1856.

Branchlet tips and ample inflorescences closely rusty lepidote; petioles about 1 cm. long; leaves obovate, long-cuneate to base, shortly acuminate, somewhat crenulate or denticulate, commonly 10 cm. long, 4.5 cm. wide, dull and glabrous above, obscurely punctate, densely lepidote beneath; panicles obtuse, longer than the leaves, the branchlets subglomerately 3–5-flowered; pedicels about 0.5 mm. long; flowers before anthesis 2.5 mm. long, nearly glabrous; sepals and petals connate to the middle, the former with coriaceous broadly ovate subrounded glabrous lobes; petals valvate with lingulate, broadly rounded, not at all inflexed, obscurely punctulate lobes; anthers ovate, acute, concolor, epunctate, the filaments nearly as long; ovary and style subequal, the stigma discoid.—The difference of opinion among capable botanists as to the genus in which this plant belongs suggests that sometimes they are fallible, even as the rest of us. The Bolivian *G. multiflorus* Mez, 239, has entire leaves, pedicels 2 (–7 in fruit) mm. long. Ecuadorian species with similarly short stamens but cucullately inflexed petals include *G. pichinchae* Mez, 239, *G. ecuadorensis* Mez, 239, and *G. andinus* Mez, 240, the first with punctate sepals and crenulate acute leaves, the second and third with epunctate sepals and entire obtusish rigid leaves, obscurely or minutely lepidote beneath, the flowers of *G. ecuadorensis* 3–3.5 mm., those of *G. andinus* 5 mm. long. F.M. Neg. 7478.

Huánuco: Compact shrub-trees near Muña, *4101; 4297* (both distr. as *G. obtusus*). Without locality, *Ruíz & Pavón*, type.

8. STYLOGYNE A. DC.

Trees or shrubs, sometimes slightly lepidote, the petioled leaves always alternate, the flowers typically umbellate-corymbose, sometimes in panicles and sometimes in short racemes, usually 5-merous, their petals dextrally convolute, very rarely imbricate. Filaments well developed. Anthers sometimes affixed medially, sometimes dehiscing apically. Stigma always small, obtuse or pulvinate.—Otherwise much like *Conomorpha*, from which it is doubtfully distinct.

In the known Peruvian species the inflorescence is axillary (rarely pseudoterminal), but Amazonian species with terminal inflorescence that may be expected include *S. nigricans* (A. DC.) Mez, 267, *S. brunnescens* Mez, 267, *S. Lhotzkyana* (A. DC.) Mez, 269, and *S. brasiliensis* (A. DC.) Mez, 269; the first two are said to have coriaceous epictate sepals, these free and emarginate in *S. nigricans*, one-third connate and not at all emarginate in *S. brunnescens;* the second two species are said to have very thin sepals, connate in the first, free in *S. brasiliensis*. The related *S. reticulata* Mez, 269, of Colombia differs (ex char.) from both in its symmetric, rounded not at all emarginate petals. *S. balaensis* Mez, 271, of Ecuador, is the only species with axillary inflorescences that has the filaments inserted high on the petals; in the others they are free or inserted near the base. In Peru the flowers are 5-merous except in *S. Mathewsii* and *S. chartacea*, as far as observed.

Inflorescence at least twice as long as petioles.
  Leaves rounded or obtusish apically; petals linear with ovate tip. *S. ambigua.*
  Leaves acute or acuminate (unless otherwise mentioned); petals acutish or oblique or rounded apically.

Leaves elliptic, about a third as wide as long; petals rounded at tip . . . . *S. Poeppigii.*

Leaves oblong- or lanceolate-elliptic, more than three times longer than wide; petals oblique . . . . *S. longifolia.*

Inflorescence little if at all longer than the petioles.

Flowers all or mostly 5-merous, subumbellate or bracts persisting.

Petioles canaliculate-alate; inflorescence glabrous or nearly.

Bracts obvious, more or less persisting; leaves ample. *S. amplifolia, S. cauliflora.*

Bracts more or less promptly caducous; leaves medium. *S. ardisioides.*

Petioles not or narrowly margined; branchlet tips and inflorescences rusty puberulent . . . . *S. serpentina.*

Flowers always (types) 4-merous, in short racemes or corymbs.

Sepals rounded, obscurely punctate; racemes short (type). *S. Mathewsii.*

Sepals acute, clearly punctate; corymbs short (type). *S. chartacea.*

Stylogyne ambigua (Mart.) Mez, Pflanzenreich IV. 236: 266. 1902. *Ardisia ambigua* Mart. in A. DC. Prodr. 8: 122. 1844.

Glabrous unless for the slightly puberulent laxly squarrose and 3–4-pinnately paniculate terminal inflorescence about as large as the large leaves, often 1.5 dm. long or longer and 5 cm. wide; petioles 1–2 cm. long, stout, margined by the cuneate based leaf-blades, these rounded or obtusish at apex, opaque, midnerve canaliculate above, prominent beneath, the slender lateral nerves and reticulate veins more or less conspicuous, punctae maculiform or obscure; pedicels and deciduous bracts scarcely 1 mm. long; flowers 3 mm. long; sepals nearly free, ovate-lanceolate, acutish, entire, membranous, with some large punctae; petals not at all punctate, more than medially connate, equaled by the long anthers, these with filaments nearly as long; ovary glabrous, ellipsoid, contracted into a stout style about twice as long, the stigma obtuse.—Unique apparently by the unusual shape (linear, with expanded tip) of the petals, but the range is rather unusual. F.M. Neg. 20067.

Río Acre: (*Ule 9683,* det. Mez). Southeastern Brazil.

Stylogyne amplifolia Macbr. Field Mus. Bot. 11: 33. 1931.

Small glabrous tree; petioles strongly wing-margined above; leaves elliptic or oblong-elliptic, acute at the broadly cuneate base, shortly acuminate, mostly 2.5–3 dm. long, 1 dm. wide, entire or lightly undulate-crenulate, chartaceous-coriaceous, more or less densely punctate both sides, somewhat lustrous above, the veins there little obvious but very closely reticulate beneath; inflorescences apparently racemose-umbellate, axillary and lateral, solitary or fasciculate, scarcely 1 cm. long; bractlets persisting, narrowly ovate, acute, about 1.5 mm. long; fruiting pedicels to 5 mm. long; sepals usually 5, shortly connate, less than 1.5 mm. long, ovate, obtuse, densely glandular-lineate, the punctae very elongate, the membranous eciliate margins nearly naked; drupes globose, almost 6 mm. in diameter, rugulose by the elongate reddish glands.—Apparently only a form or variant of *S. cauliflora*. *Klug 2148* has flowers 3.5 mm. long, the revolute petals scarcely as long as the basally inserted stamens, these with elongate filaments and anthers.

Junín: Puerto Yessup, *Killip & Smith 26279*.—Loreto: Caballo-Cocha, *Williams 2117*, type; *2081*. Balsapuerto, *Klug 2918; Killip & Smith 28376*. Near Iquitos, *Killip & Smith 27403; 29289; 29322*. Lower Río Nanay, *Williams 587*. Florida, Río Putumayo, *Klug 2148* (det. Standley). "Taife-diablo," "jipina-coca" (both, Klug).

Stylogyne ardisioides (HBK.) Mez, Pflanzenreich IV. 236: 276. 1902. *Myrsine ardisioides* HBK. Nov. Gen. & Sp. 3: 249. 1819. *Rapanea pallens* Macbr. Candollea 5: 397. 1934?

Glabrous, the branches few, the terete branchlets brown; petioles 6–8 mm. long; leaves oblong-elliptic, acute or shortly cuneate at base, imperfect in type but apparently more or less acuminate, about 1.5 dm. long, 6–8 cm. wide, or smaller, membranous, paler beneath, reticulate-veined, the primary nerves approximate; corymbs axillary, solitary, sessile, simple, 6–7-flowered, scarcely exceeding the petioles, the pedicels 3–4 (–6) mm. long; flowers 5-merous, 4–6 mm. long, both calyx lobes and corolla glandular punctate (not lineate), the former subrotund-ovate, obtuse, 4 times shorter than the latter, this with ovate obtuse revolute segments; stamens exserted, inserted with short filaments at base of corolla, the dorsally affixed anthers lanceolate, elongate; fruit depressed-globose, glandular-rugulose, the size of a pea (Bonpland).—Apparently resembles *S. cauliflora* and probably placed here by Mez because of the position of the stamens and the elongate anthers; he, however, found the type "neither at Paris or Berlin." Bonpland remarked: origin of type unknown; scarcely distinct from *Manglillo Jussieui* (i.e. *Rapanea manglillo*) unless in the larger leaves and fruits, the former acuminate-cuneate at base. My proposed species in fruit is ex photo and char. the same; the leaves are attenuate both ends, acuminate, pale green, mostly 12 cm. long, a third as wide, sepals acutish, fruit about 5 mm. in diameter. F.M. Neg. 38720.

Loreto: Puerto Arturo, lower Río Huallaga, *Williams 5330* (type, *R. pallens*); *Killip & Smith 27802; 27881*. Santa Rosa, *Killip & Smith 28941*. Without locality, *Bonpland*, type.

Stylogyne cauliflora (Mart. & Miq.) Mez, Pflanzenreich IV. 236: 276. 1902. *Ardisia cauliflora* Mart. & Miq. in Mart. Fl. Bras. 10: 291. *pl. 35*. 1856.

Stout verruculose branchlets and short—scarcely 1.5 cm. long—cauliflower panicles obscurely lepidote; petioles stout, margined by the decurrent leaves, to 12 mm. long; leaves rather abruptly acuminate, coriaceous-chartaceous, dull, to 3 dm. long, a third as wide, densely verruculose-venose both sides, obscurely punctate; pedicels to 3 mm. long, the bracts (as to type) deciduous; flowers 3 mm. long, glabrous, the sepals and petals closely punctate but with no elongate pictae (as to type), the former nearly free, very obscurely crenulate, the latter oblique at apex, recurving at anthesis, shortly connate at base, longer than the stamens; anthers long, subacute, dorsifixed near base, concolor, epunctate.—Probably should be drawn to include my *S. amplifolia* unless there are other characters than the shape of the punctae and the relative persistence of the bracts. Tree, 7 meters high (Krukoff). F.M. Neg. 20068.

Río Acre: Río Macauhán, *Krukoff 5662?* Brazil.

Stylogyne chartacea Macbr., comb. nov. *Rapanea chartacea* Macbr. Candollea 5: 396. 1934.

Nearly glabrous shrub or the young somewhat spreading branchlets obscurely puberulent at tip; petioles scarcely 5 mm. long, winged above, nearly 3 mm. wide; leaves subelliptic, broadly cuneate-acute at base, shortly and acutely acuminate at tip, 12–14 cm. long, 4.5–6 cm. wide, pale green, chartaceous, prominently reticulate and glandular punctate on both sides, little nitidulous; branches of the inflorescence nodose, 6–8-flowered; pedicels pulverulent, 2 mm. long; flowers about 2.5 mm. long; sepals 4, nearly free, ovate, acute, eciliate, not at all herbaceous, white-chartaceous, nearly hyaline, more or less brown punctate; anthers apparently basally affixed and triangular, longer than filaments.—Flowers not fully developed, but on re-examination the shrub is certainly a species of *Stylogyne* but is apparently not exactly referable to any thus far proposed; *S. indecora* Mez, 277, of Pará, seems similar but the sepals are not punctate (of course a dubious distinction).

Loreto: Iquitos, *Williams 8049*, type. Yurimaguas, *Killip & Smith 27638?*

Stylogyne longifolia (Mart.) Mez, Pflanzenreich IV. 236: 276. 1902. *Ardisia longifolia* Mart. ex Miq. in Mart. Fl. Bras. 10: 290. 1856.

Glabrous, even the young flowers, the branchlets moderately stout; leaves elliptic-lanceolate, subacuminate both ends, narrowly decurrent on the petioles (these to 2 cm. long), entire, sometimes nearly 3 dm. long, 6–8.5 cm. wide, chartaceous, glabrous, rather densely costulate-veined and beneath somewhat reticulate, obsoletely punctate; inflorescence densely thyrsoid, axillary or pseudoterminal, the panicles to 5 cm. long; flowers at least 4 mm. long, 5-merous, the broadly rounded ovate entire membranous sepals with many large punctae; petals one-fifth connate, the lobes oblong-elliptic, obliquely emarginate apically, strongly lineate-punctate, much exceeding the stamens; acutish anthers more than twice as long as filaments; ovary reduced in male flowers, the stigma capitate.—Some of the following collections in fruit may not belong in this group; apparently *S. longifolia* is the earliest name (if inflorescence is axillary or pseudoterminal) for several closely related species or forms: *S. Poeppigii* Mez, 274, the apically rounded petals scarcely emarginate; *S. amazonica* Mez, 275, petals obliquely emarginate, leaves rigid-coriaceous, the veins thus obscure; *S. venezuelana* Mez, 273, the leaves oblong, 16×4 cm.; also *S. atra* Mez and *S. laxiflora* [Benth.] Mez, both 273, the glandular punctae lacking on sepals and petals, the latter perhaps distinct by its elongate lax inflorescence, leaves about 20×6 or 7 cm., petals acute (not obliquely). It is doubtful if the presence of glands is a specific character unless associated with other characters. *S. Spruceana* Mez, 274, has been distinguished by the author by the long pedicels, these even at anthesis to 12 mm. long. F.M. Negs. 20071; 4840 (*Poeppig*).

San Martín: Tocache, *Poeppig*.—Loreto: Pinchana near Iquitos, *Williams 3766?* (fruiting; suggests *S. laxiflora*). Manfinfa, Upper Río Nanay, *Williams 1126?* (fruit). Pena Blanca, Río Itaya, *Killip & Smith 29661?* (fruit). Mishuyacu, *Klug 1414* (distr. as *S. Poeppigii* vel aff.). Río Itaya, *Killip & Smith 29540?* (young). Brazil.

Stylogyne Mathewsii Mez, Pflanzenreich IV. 236: 278. 1902.

Completely glabrous, the branchlets slender, the petioles about 7 mm. long; leaves elliptic, acute at base, shortly acuminate, entire, about 1 dm. long, 4 cm. wide, membranous, subopaque, a little reddish beneath, densely costulate and reticulate on both sides, more or less punctate-spotted especially toward the base; inflorescence axillary, simple, racemose, about as long as the petioles; pedicels 3 mm. long; sepals 4, one-fourth connate, sublingulate, broadly rounded at tip, not at all emarginate, obscurely punctate; ovary ellipsoid, 3–4-ovuled.—Imperfectly known and aberrant in the genus in the simple inflorescence; may be from Chachapoyas. *S. indecora* Mez, of the lower Amazon, has epictate, "narrowly rounded" sepals and may well be a form. The character of simple racemes is doubtfully constant.

San Martín: Juanjuí, *Klug 3911?* (det. Standley, *S. Poeppigii*, with query). Without locality, (*Mathews 1200*, type, herb. Kew).

Stylogyne Poeppigii Mez, Pflanzenreich IV. 236: 274. 1902.

Glabrous, including the white flowers, the branchlets rather stout, the branched panicles borne on them below the leaves and about 3 cm. long, 2 cm. wide or smaller with conspicuous elliptic membranous bracts that are longer than the pedicels; petioles 7 mm. long, stout; leaves elliptic-lanceolate, entire but undulate-margined, to 2 dm. long, 7 cm. wide, acute at base, shortly but acutely acuminate, coriaceous, dull, finely venose on both sides, rather prominently lineate and with a few scattered punctae; pedicels rarely 5 mm. long; flowers 5-merous, subcorymbose, the ovate rounded sepals nearly one-fourth connate, emarginate-crenate apically, strongly punctate; petals nearly free, ovate, asymmetric, scarcely emarginate at the rounded tip, slightly longer than the stamens; anthers elongate, affixed above the base to the much shorter filaments, concolor and epunctate dorsally; ovary depressed, the stigma obtuse.—S. *balaensis* Mez, 271, of southern Ecuador, has obtuse or basally short-acuminate leaves, rather ample inflorescences, the epunctate sepals crenulate; *S. amazonica* Mez, 275, has acutely acuminate narrowly elliptic rigid coriaceous not reticulate leaves, the petals strongly oblique and emarginate; cf. also note under *S. longifolia*, the determinations doubtful. F.M. Neg. 31983.

Loreto: Mishuyacu near Iquitos, *Klug 937; 1414; 1584* (det. Standley). Río Mazán, *José Schunke 80* (det. Standley). Amazonian Brazil.

Stylogyne serpentina Mez, Repert. Nov. Sp. 16: 420. 1920.

Shrub as much as 10 meters high with very slender serpentinely curved branchlets, the younger rusty tomentulose as also the axillary short densely corymbose inflorescence; petioles not at all winged, the blades only slightly and obliquely decurrent, to 8 mm. long; leaves elliptic, acute at base, shortly acuminate, to 14 cm. long, 5.5 cm. wide, glabrous, evidently paler beneath, chartaceous and with scattered prominent punctae; pedicels scarcely longer than 2 mm., the shorter bracts scale-like; flowers white, 5-merous, before anthesis to 2.5 mm. long, the sepals as petals shortly connate, the former very sparsely pilose and with a few lineate punctae, the latter obliquely acutish, recurving, equaled by the long stamens, the ovate anthers dorsifixed near the base, not at all punctate; ovary of male flowers reduced, glabrous.—Possibly similar are *S. laxiflora* (Benth.) Mez and *S. atra* Mez, both 273, of northern Brazil or Río Negro and both with flowers twice as long, the petals of the former gradually acute, of the latter obliquely acutish. *S. amazonica* Mez, 275, has ereticulate leaves, pictate petals. F.M. Neg. 4845.

Río Acre: Seringal Auristella, *Ule 9688*, type.

9. CONOMORPHA A. DC.

Shrubs or small trees, the branches nearly always more or less rusty puberulent, the petioled leaves often closely pseudoverticillate and ordinarily entire, the 4- or 5-merous flowers small and commonly in simple axillary racemes, rarely panicled. Bracts always small. Sepals rarely connate, usually acute, generally punctate, exceptionally eciliolate. Petals more or less connate, valvate or obscurely imbricate, exceeding the subsessile anthers, these elongate, acutish or often rounded, recurving, dorsifixed a little above the base, dehiscing their entire length by 2 clefts; episepalous bodies more or less developed. Ovary usually attenuate into a thick style, the stigma often lobulate. Fruit with crustaceous endocarp, the solitary seed globose.—Some of the proposed species seem to be weakly demarcated; those with compound inflorescence simulate *Geissanthus* but anthers subsessile or filaments short.

Leaves subverticillate even at lower nodes; flowers racemose.
  Leaves more or less obviously sinuate-margined, lanceolate. *C. quercifolia.*
  Leaves entire or nearly.

Flowers 5-merous; leaves oblong-lanceolate or -obovate, acute to acuminate.................................*C. Preslii.*

Flowers 4-merous; leaves elliptic...................*C. dubia.*

Leaves soon scattered, only the terminal approximate, or the inflorescence much-branched.

Inflorescence simply racemose or sometimes somewhat branched; flowers at least mostly 4-merous; ovary (known) lepidote.

Leaves about 3.5 cm. long, coppery lepidote beneath; sepals not lepidote....................................*C. laeta.*

Leaves often 5–8 cm. long or longer, rusty lepidote beneath or soon glabrate; sepals lepidote or glandular.

Petals connate near base; leaves about 1 dm. long or longer. *C. Weberbaueri.*

Petals medially connate; leaves often shorter than 1 dm. *C. peruviana.*

Inflorescence clearly compound, more or less pseudoterminal; ovary glabrous.

Filaments longer than anthers; leaves fulvous furfuraceous-lepidote beneath.........................*C. myriantha.*

Filaments obsolete or shorter than anthers; indument of leaves lacking or inconspicuous.

Leaves oblong- or narrowly obovate-elliptic, about 4 cm. wide.

Inflorescence ample, much exceeding leaves. *C. pyramidata.*

Inflorescence shorter than leaves..............*C. discolor.*

Leaves broadly elliptic-obovate, 5–6 cm. wide......*C. abdita.*

Conomorpha abdita Macbr., nom. nov. *Geissanthus abditus* Macbr. Field Mus. Bot. 8: 127. 1930.

An essentially glabrous shrub, the rather stout branchlets slightly angled toward the tips; leaves obovate-elliptic, somewhat attenuate to base and decurrent into the short (5 mm. long) petioles, obtuse or rounded at apex (or with a broad rounded short acumen), entire or obscurely undulate, mostly 12 cm. long, 5–6 cm. wide, rather rigid-chartaceous, dull above, the nerves scarcely obvious, paler and reticulately veined beneath, pronounced pustules nearly lacking; panicles pyramidate, 1 dm. long, 6 cm. wide, the nearly glabrous 5-merous subsessile flowers 2.5 mm. long; calyx (only known in anthesis) glabrous, the ovate lobes very obscurely punctate as also the lingulate petals if at all; stamens much shorter than the petals, scarcely emerging from the throat, the oblong-ovate anthers acutish; ovary glabrous, the slender cylindrical style with discoid stigma.—Simulates *Geissanthus*, especially *G. Haenkeanus* and *G. dentatus*, except for the extremely short stamens; this character (after Mez' treatment) allies it to *G. peruvianus*, which is much more pubescent and with acuminate leaves; the short filaments suggest it is rather a *Conomorpha*. It is doubtful if *Stylogyne* and *Geissanthus* are not better included in *Conomorpha;* all group concepts here may be incorrect.

Huánuco: Open tree-shrub, Muña, *3978*, type. Pampayacu, *Sawada 11*.

Conomorpha discolor Mez, Repert. Nov. Sp. 16: 419. 1920.

Branchlets very stout, tortuous, the younger densely appressed rusty lepidote, the older glabrate, pale and strongly verrucose; petioles to 10 mm. long; leaves oblong-elliptic, subcuneate to the acute base, broadly and shortly acute or subacuminate, to 12 cm. long, 4.5 cm. wide, rather rigid, dull, glaucous green above, closely nerved both sides and, especially beneath, where reddish, laxly reticulate, lepidote, not at all glandular; panicles pseudoterminal from new branchlets and similarly pubescent, much shorter than the leaves; pedicels scarcely more than 2 mm. long, longer than the scale-like bracts; flowers white, apparently only about 2.5 mm. long, the sepals connate above the middle, the well-imbricated lobes suborbicular, crenulate-ciliolate, densely punctate below, little or scarcely so above as also the petals; anthers ovate, subsessile; ovary glabrous, globose, the short style with large discoid stigma.—Cf. *C. pyramidata*, in which it may be merged.

Piura: Hacienda Chantuco, Prov. Huancabamba, *Weberbauer 6316*, type. At Jicate, *Weberbauer 6327*.—La Libertad: Prov. Otuzco, *Weberbauer 6992* (det. Mansfeld, *C. pyramidata*).

Conomorpha dubia Macbr. Candollea 6: 17. 1934.

Shrub 2–3 meters high with glabrate virgate branches and definitely pseudoverticillate leaves on petioles 5–7 mm. long; leaves elliptic, cuneately acute both ends, about 1 dm. long, 4–4.5 cm. wide, subcoriaceous, nearly opaque both sides, finely and closely reticulate-veined, densely black-punctate above, glabrous beneath except for a brown granulosity; racemes 1.5–2.5 cm. long, puberulent, the pedicels scarcely 0.5 mm. long; sepals and petals 4, entire, conspicuously dotted, the former connate at base, narrowly ovate, acuminate, 1 mm.

long, the latter connate nearly to the middle, about twice as long, oblong-ovate, acute, the margins undulate; anthers epunctate, subovate or ovate-rounded, medially affixed dorsally; ovary punctate, the style elongate.—Fruit described as dull yellow. The facies is that of this genus (as *C. pastensis* Mez of Colombia, for example), but the anthers seem to approach those of the genus *Weigeltia*. I have not seen material in the preparation of this account.

Loreto: Mishuyacu near Iquitos, *Klug 29906*, type.

Conomorpha laeta Mez, Pflanzenreich IV. 236: 257. 1902.

Slender branchlets, leaves beneath and short dense racemes densely lustrous coppery lepidote; petioles about 5 mm. long; leaves oblong, attenuate both ends, shortly acute, to 3.5 cm. long, 14 mm. wide, rather rigid, glabrate, dull pale green above; racemes rarely 8-flowered, the pedicels scarcely more than 1 mm. long; flowers lepidote, 3.5–4 mm. long, normally 4-merous; sepals to one-third connate, the broadly ovate acute lobes not at all pictate; petals entire, broadly acute, lepidote within, connate more than three-fourths, longer than the stamens; episepalous lobes lacking; female flowers unknown, the ovary in the male sparsely lepidote.—Ex char. seems similar to *C. peruviana*, but the leaves are smaller.

Amazonas: Taulia, (*Mathews 1561*, type, herb. Kew). East of Chachapoyas, 2,000 meters, *Weberbauer*, 263.

Conomorpha myriantha Mansf. Notizbl. Bot. Gart. Berlin 9: 467. 1925.

Young branchlets and their leaves beneath more or less densely brown furfuraceous-lepidote; petioles 1–1.5 cm. long; leaves alternate, nearly oblong-elliptic, acute or shortly cuneate at base, rounded at tip, 7.5–12.5 cm. long, 3.5–5.5 cm. wide, coriaceous, glabrous and opaque above, verruculose and with some scattered punctae, nerves scarcely or not prominent, slightly more so beneath; inflorescence terminal, pyramidal, about 2 dm. long, more than half as wide at base, the axis densely lepidote; flowers 5-merous, pedicels to 1 mm. long; sepals about one-third connate, broadly ovate, pictate as the apically rounded petals, these 4.2 mm. long; stamens inserted a little above the base, filaments 2.8 mm. long, anthers ovate, 1.3 mm. long; style 2.2 mm. long; ovary glabrous.—It is not with complete confidence that this is retained here as the filaments are elongate as in *Geissanthus* and *Stylogyne;* however, no young flowering buds have been observed.

Amazonas: San Carlos, 2,600 meters, *Weberbauer 7158*, type.

Conomorpha peruviana A. DC. Ann. Sci. Nat. sér. 2. 16: 92. 1841; 262. *Cybianthus peruvianus* (A. DC.) Miq. in Mart. Fl. Bras. 10: 298. 1856. *C. guyanensis* A. DC. l.c.

Becoming a tree, the short stoutish branchlets and paniculate or racemose inflorescences—these shorter than the leaves—closely rusty lepidote; petioles to about 15 mm. long; leaves broadly elliptic or somewhat obovate, narrowed to both ends, acute, 8 cm. long, half as wide (or apparently to twice as large or larger), chartaceous, rusty beneath; panicles spreading or pendulous, bipinnately divided near the base, 20–30-flowered; pedicels and bracts subequal, shorter than 1 mm.; flowers 4-merous, about 2 mm. long, the ovate fimbriate sepals nearly one-third connate and with a few large long glands, the ovate acutish petals medially connate, papillose within; anthers epunctate, sessile or essentially, shorter than the petals; style short, obtuse.—Kuntze used the generic name *Peckia* for this plant. F.M. Neg. 8623.

Cajamarca: Cutervo, *Jelski 360.*—San Martín: Zepelacio, *Klug 3508* (det. Standley). Chazuta, *Klug 4106* (det. Standley).—Junín: La Merced, *Killip & Smith 24011; Killip & Smith 24469.* Above Huacapistana, 2,700 meters, *Weberbauer*, 251. Pichis Trail, *Killip & Smith 26073; 26168.* Puerto Yessup, *Killip & Smith 26286.* Puerto Bermudez, *Killip & Smith 26464; 26563; 26548.*—Loreto: Iquitos, *Killip & Smith 27005; 29871; Klug 1412; 2565.* Río Nanay, *Williams 965; 1182.* Pumayacu, *Klug 3165* (det. Standley). Santa Rosa, *Killip & Smith 28855.* Bolivia to the West Indies. "Urpai-micuna" (Williams).

Conomorpha Preslii Macbr. Candollea 5: 398. 1934. *Myrsine verticillata* Presl, Rel. Haenk. 2: 64. 1835, not *C. verticillata* Zahlbr. Ann. Naturh. Hofmus. Wien. 7: 3. 1892. *C. verticillata* (Presl) Mez, Pflanzenreich IV. 236: 252. 1902.

Branchlets slender, the tips only obscurely and unevenly rusty lepidote; petioles to about 15 mm. long; leaves lanceolate, long-attenuate to base, acuminate, to 12 cm. long, 2.5 cm. wide (15 cm. by 6 cm. in Stork and Horton specimens), nearly entire, membranous, densely punctate, glabrous or the younger sparsely lepidote, the nerves and veins prominent, especially beneath at maturity; racemes lax, rather few-flowered, to 6 cm. long, rusty furfuraceous in axils or puberulent-pilose, the slender pedicels to 3 mm. long; flowers densely punctate, 1–2 mm. long; sepals ovate-elliptic, acute, typically densely ciliate; petals rarely one-third connate, the typically glabrous (ciliolate, Stork & Horton) entire lobes ovate, acute or obtusish; anthers large; ovary sparsely punctate with short thick style.—*C. verticillata* Zahlbr. (i.e. *C. Jelskii* Mez, l.c., 251) may become *C. Preslii* var. **Jelskii** (Mez) Macbr., comb. nov., like the type but the sepals crenate-ciliate, the petals minutely ciliolate; the very short filaments are calloused at base (not described as to type of species). A shrub 2.5 meters high with greenish-white densely red glandular dotted flowers (Stork & Horton), the racemes all on new branchlets. *C. pastensis* Mez, 252, is doubtfully distinct on the basis of more rounded, somewhat crenulate petals. F.M. Neg. 31981; 31980 (*C. Jelskii*).

Cajamarca: Huancabamba, *Weberbauer 6099*. Cutervo, *Jelski* (type, *C. Jelskii*). Socota, 3,200 meters, *Stork & Horton 10134* (det. Standley).—Huánuco: In the mountains, *Haenke 98*, type. Without locality, *Rivero*.

Conomorpha pyramidata Mez, Repert. Nov. Sp. 3: 102. 1906.

Branchlets stout, terete, the younger densely appressed tomentose with rusty trichomes; petioles about 1 cm. long, nearly flat above; leaves narrowly obovate, cuneate at base, rounded at tip, about 1 dm. long, 4 cm. wide, coriaceous, with some large scattered punctae on both sides, rubescent and lineate-venose beneath; inflorescence terminal, ample, pyramidately paniculate, to about 1.5 dm. long, slightly rusty lepidote; pedicels to 1.5 mm. long; flowers racemose, 5-merous, small, white; sepals punctate, broadly ovate to rotund, one-third connate, crenulate; petals scarcely one-third connate, glabrous, not at all punctate; anthers acute, not quite sessile; ovary glabrous, the very stout style with disciform stigma.—Type 5 meters high, *Weberbauer 6992*, 20 meters high. According to Mez this is aberrant and may not belong to the genus like the allied *C. Sodiroana* Mez, 254, of Ecuador, which also has the aspect of *Geissanthus* but imbricate sepals; the Ecuador shrub has punctate petals, filaments as long as the anthers.

Cajamarca: Along streams near San Pablo, 2,000 meters, *Weberbauer 3874*, type; 256; 257. "Yerva del cura."

Conomorpha quercifolia Mez, Pflanzenreich IV. 236: 253. 1902.

Branchlets very slender, minutely glandular puberulent toward the tips; petioles elongate; leaves lanceolate, narrowed to both ends, elegantly acuminate, about 1 dm. long, 2.5 cm. wide, thin-membranous, sinuate-crenate, glabrous and smooth but with large scattered dark punctae; racemes few (–7) -flowered, puberulent, much shorter than the leaves; pedicels about 1 mm. long; flowers 1 mm. broad; sepals connate at base, obovate, acuminate, densely ciliate and with large glands; petals connate to above the middle, ovate, entire, glabrous; anthers unknown; ovary glabrous, longer than the style, the stigma broadly obtuse.—With the facies of *Myrsine* L. (Mez); some leaves are nearly entire. *C. dentata* Mez, 252, of Ecuador, has denticulate leaves, punctate ovary. F.M. Neg. 38609.

Peru(?): Without locality, *Dombey; Pavón* (herbs. Boissier and Paris).

Conomorpha Weberbaueri Mez, Repert. Nov. Sp. 3: 101. 1906.

Becoming a tree, the type even 10 meters high with slender subterete branchlets, the younger as the petioles, leaves and lateral inflorescences densely appressed rusty lepidote; leaves elliptic, cuneately decurrent on the slender 1 cm. long petioles, abruptly and shortly acuminate, 9–15 cm. long, 3–6 cm. wide, chartaceous, finally glabrate and lustrous above, obscurely but densely lineate beneath; inflorescence simple or few-branched, much shorter than the leaves; pedicels 1–1.5 mm. long, longer than the bracts; flowers mostly 4-merous, suberect-spreading, 1.75 mm. long; sepals dorsally and marginally lepidote, not evidently punctate, shortly connate; petals epunctate, scarcely one-third connate, papillose within, narrowly rounded at tip, much longer than the stamens, the short filaments episepalously denticulate; ovary clavate with stout style about as long.—Allied by the author to *C. punctata* Mez, 260, of British Guiana. A low hardwood shrub, the white flowers flecked with pink (Stork & Horton). *C. pseudo-icacorea* (Miq.) Mez, 261, of Brazil, has beautifully acuminate leaves, racemes little longer than the petioles. F.M. Neg. 4835.

San Martín: Valley of the Río Mayo near Moyobamba, 860 meters, *Weberbauer 4668*, type; 289.—Huánuco: Below Tingo María, *Stork & Horton 9541*. La Merced, *5677*.

PLUMBAGINACEAE Lindl.

With the general characteristics of the Primulaceae but styles 5, distinct or more or less connate, ovule solitary and pendulous from a basal funicle, the 1-seeded fruit indehiscent or tardily calyptrately dehiscent, rarely valvate from the base. Endosperm present or lacking.

The cultivated Thrift, Marsh Rosemary or Sea Lavender (*Statice* or *Armeria* and *Limonium* species), common to warm shores and marshes but apparently not yet adventive in Peru, belong here. In the former the flowers with scarious bracts and calyces are in a globose head terminating a naked scape, in the latter in short spikes or clusters at tips of branchlets of a branched scape, both to be expected as garden escapes.

PLUMBAGO L.

Herbs or vines, herbaceous or more or less shrubby with usually clasping petioles or leaves and the flowers in terminal bracted spikes. Calyx tubular, more or less glandular, the sinuses hyaline, the 4–5 lobes erect. Corolla tube slender, the entire spreading segments with connate claws. Capsule membranous, circumscissile or 5-valved.

Calyces glabrous toward base.
  Corolla tube about 3 cm. long .... *P. capensis.*
  Corolla tube about 1 cm. long .... *P. coerulea.*
Calyces stipitate glandular to base.
  Corolla white or purplish, the lobes truncate .... *P. scandens.*
  Corolla roseate, the lobes rounded .... *P. indica.*

Plumbago capensis Thunb. Prodr. Pl. Cap. 33. 1794–1800.

Clambering or spreading unless supported half-shrub with oblong-spatulate or obovate leaves, these cuneate to the short petioles, obtuse but mucronate, often about 5 cm. long and with short spikes of usually azure blue flowers, these glabrous as the rest of the plant except for some stiped glands on the upper part of the calyx; corolla tube about 3.5 cm. long.—The Williams collections apparently in part were escapes from cultivation; at La Victoria it was found in gardens.

Loreto: Fortaleza, *Williams 4322.* Caballo-Cocha, *Williams 2369.* Yurimaguas, *Williams 4045.* South Africa.

Plumbago coerulea HBK. Nov. Gen. & Sp. 2: 220. 1818.

Procumbent or climbing herb, the terete branches sulcate and more or less viscous glandular or glabrate, the branchlets and spikes more so, the latter also pilose (slightly) or puberulent; leaves sessile; calyx glabrous, about 8 mm. long toward the base, but with several to many short rigid gland-tipped trichomes above; corolla blue, the somewhat exserted tube about 1 cm. long, the lobes acute.—Often sprawling, not rarely on gravelly slopes, the flowers deep blue or purple or lavender, the tones often variously combined. Illustrated, Bot. Mag. *pl. 2917* (as *P. rhomboidea* Hook.).

Piura: Huancabamba, *Bonpland*, type.—Lima: Matucana, *101; Goodspeed 11324*. Río Chillón, *Pennell 14451*. Ambar, *Stork 11459*. —Huánuco: San Rafael, *Sawada 111*. Huacho, 1,900 meters, *Stork & Horton 9397*.—Junín: Tarma, *Killip & Smith 21924*.—Ayacucho: Near Ayacucho, 2,750 meters, *West 3645*.—Apurímac: East of Abancay, 2,400 meters, *Goodspeed 10556; Soukup 718*.—Cuzco: Anta, *Vargas 203*. Collcha, *Vargas 9733*. Urubamba Valley, *Herrera 1530*. —Arequipa: East of Chala, 100 meters, *Worth & Morrison 15614*. "Rata-rata," "yanahuarmi" (West), "sarna-vejiguilla" (Herrera).

Plumbago indica L. in Stickman, Herb. Amb. 24. 1754; Amoen. Acad. 4: 133. 1759. *P. rosea* L. Sp. Pl. ed. 2. 215. 1762.

More or less climbing or supported striate-stemmed, nearly glabrous half-shrub with long racemes of purple-red to scarlet flowers, the calyx stipitate glandular, the slender corolla tube to about 2.5 cm. long; leaves ovate-elliptic, sometimes 1 dm. long, the petioles somewhat clasping.—Marked by the almost filiform corolla tube at least 2 cm. long and the large broadly rounded but finely mucronulate lobes.

Loreto: Caballo-Cocha on the Amazon, *Williams 2386*. Southern Asia.

Plumbago scandens L. Sp. Pl. ed. 2. 215. 1762.

Much branched, sprawling, climbing or erect, the several dm. long branches somewhat grooved, glabrous except the bristly glandular calyx, this with tube 1 cm. long, the lobes hooked; corolla white or purplish, the tube to 2 cm. long, the lobes truncate-mucronulate; stamens 4, the exserted anthers blue; capsule enclosed in the indurate calyx.—The leaves are more or less clasping at the base of the short or elongating petioles.

Piura: Serrán, 100 meters along river thickets, *Stork 11388*. Ponta, Talara, *Hought 74*.—Cajamarca: East of Huambos, in shrub-land, 2,500 meters, *Stork & Horton 10205*.—Lambayeque: Almos, *Weberbauer 7093*.—San Martín: Tarapoto, *Williams 6763*. Juanjuí, *Klug 4279; 4337*.—Huánuco: Brushy trail-edge, Pozuzo, *4617* (distr. as *P. coerulea*).

EBENACEAE Endl.

Reference: W. P. Hiern, Trans. Cambr. Phil. Soc. 12: 27–300. 1873.

Trees or shrubs, the wood usually hard, the sap not lacteal, the leaves alternate or subopposite, entire and without stipules. Flowers regular, often dioecious, the male with rudimentary ovary, the female imperfect or no stamens and usually solitary. Calyx and corolla gamopetalous, the 3–6 lobes of the former persisting and often accrescent, the 3–7 lobes of the latter commonly contorted. Stamens hypogynous or at base of corolla, 2–4 times as many as the corolla lobes, rarely as many and alternate, the filaments free or paired, the anthers 2-celled, introrse, dehiscent longitudinally. Ovary superior, 3 or more celled with 1–2 ovules on each cell pendulous from the inner angle. Style often parted. Fruit more or less succulent, the seed testa thin, the endosperm copious.—One genus in Peru.

DIOSPYROS [Dalech.] L.

Maba J. R. & G. Forster, Char. Gen. 121. *pl. 61.* 1776.

Character of family; flowers axillary or at nodes, solitary or sometimes cymose, dioecious, 3–5-merous, calyx accrescent or not, stamens 3–many or 4–8 and often biseriate (rarely many and medially 4-seriate, with 1 lower) with as many staminodia or these lacking, styles or style branches 3 (1–4) or rarely none.—Many species are known incompletely, especially only one sex, or in fruit, and a natural alignment will evolve only as collections provide complete data, as noted by Sandwith (Kew Bull. 481–493. 1949; index unfortunately incomplete), whose acute observations on a number of the Amazonian species have been of great service in the compilation of this account of the described Peruvian forms. Attention may be called to *Anona lasiocalyx* Mart. of Brazil, with barely or scarcely acute leaves, which is some species of *Diospyros* according to Fries, Act. Hort. Berg. 10: 313.

Name derived from Jupiter and grain (in Greek), in allusion to the presumed life-giving properties of the fruit.

Genus noted as the source of valuable woods, especially "Ebony" (at least typically from *D. Ebenum* Koenig and related species) of India and Ceylon. It also provides the "Kaki Plum" (*D. Kaki* L. f.) of Japan, probably cultivated in Peru as often elsewhere and the exotic-tasting (to a northerner) "persimmon" (*D. virginianum* L.) of the United States, the readily detachable bark of the young branchlets, as doubtless also for Peruvian species, popular with boys for the making of whistles.

Leaves oblong or nearly oblong, 3–4 times longer than wide or, if ovate-lanceolate, only 1.5–3 (4) cm. wide (unless in mentioned species).

Petioles about 1.5 cm. long; leaves ample, veiny... *D. Tessmannii.*

Petioles much shorter; leaves often small or veins obscure.

Leaves densely sericeous beneath, very acutely acuminate. *C. pseudoxylopia.*

Leaves sparsely pubescent or glabrous beneath, short- (usually obtusely) acuminate.

Leaves ample, acutely short-acuminate, the nerves obscure. *D. opacifolia.*

Leaves small, obtusely short-acuminate, the nerves rather prominent.......................... *D. Poeppigiana.*

Leaves rather ovate or elliptic, rarely obovate, mostly 4 cm. wide or wider, often much wider.

Leaves obtusish, or obtusely short-acuminate.

Indument of oval leaves beneath velutinous........ *D. Pavonii.*

Indument of rather obovate leaves soon sparse... *D. inconstans.*

Leaves acute or acutely acuminate, sometimes densely but not softly pubescent beneath (unless in mentioned species).

Leaves coriaceous, ovate-oblong, evenly pubescent and rugulose-tuberculate beneath .... *D. peruviana.*

Leaves chartaceous, ovate-elliptic; indument soon uneven or sparse (see also *D. amazonica*).

Flowers congested, subsessile............. *D. artanthaefolia.*

Flowers in open cymes, pedicelled............. *D. subrotata.*

Diospyros amazonica Krause, Verhandl. Bot. Ver. Brandenb. 48: 193. 1907.

Erect, branched tree, to 8 meters tall, the erect terete spreading branchlets sulcate above, the younger sparsely pilose as the leaves beneath, especially on the midnerve; petioles alternate, canaliculate above, 1 cm. long; leaves broadly ovate or elliptic, rounded at base, acuminate, 1.5–2 dm. long, to about 9 cm. wide medially, subcoriaceous, entire, nerves impressed above, subprominent beneath; inflorescence (only male known) cymose, 1.5–2 cm. long, axillary, congested, 8–12-flowered; peduncles stout, about 8 mm. long, pedicels very short, sparsely fuscous pilose; calyx campanulate, shortly pilose within and without, the 5 ovate acute lobes equaling the tube; corolla urceolate, deeply 5-lobed, the lobes glabrous within, ovate or elliptic; stamens many, long-pilose, subequal, subsessile, the linear anthers much longer than filaments.—After Hiern's monograph near *D. Weddellii* Hiern but corolla deeply lobed, stamens pubescent, leaves not cordate (Krause), *Ule 5171*, near Itapaiana Jurua, Amazonian Brazil, the type. Krause referred here a specimen which seems to be *D. subrotata*, but the species is not clearly defined.

Peru (possibly). Brazil.

Diospyros artanthaefolia Mart. Fl. Bras. 7: 7. 1856; 255.

Sinuous branches, petioles (these about 8 mm. long) and leaves beneath, especially on the midrib and rather prominent veins, brown villous; leaves firm-membranous, elliptic-oblong or ovate-elliptic, rounded or contracted at base, cuspidate-acuminate, 10–17.5 cm. long, 5–10 cm. wide, rather paler beneath with 8–13 lateral nerves on each side, the veins immersed above; female flowers axillary, solitary or binate, subsessile; calyx 5-parted, the deltoid fruiting lobes obtuse(?), reddish hirsute, especially medially; berry depressed globose, 8-celled, densely lustrous red setose, to 3 cm. in diameter; male flowers several, subsessile, about 6 mm. long, the stamens apparently only 15–20.—*D. Pearcei* Hiern, 252, is from Bolivia, according to Sandwith, who thinks it is conspecific; the male flowers have acute calyx lobes, corolla 7 mm. long, stamens about 30. *D. glomerata* Spruce, described from male specimens, is also apparently the same. *D. velutina* Hiern, 200, Brazil to Colombia(?), has leaves 2–6 cm. wide, female flowers on peduncles 5–8 mm. long, the calyx 3–5-lobed. *D. Goudotii* Hiern, Colombia, has leaves subsessile, the fruiting peduncles to 12 mm. long, the 5 calyx lobes pubescent on both sides, the fruit papillose and pilose, especially apically. The Williams collections were referred by Standley to *D. peruviana*, which seems to be distinct. *D. juruensis* A. C. Sm., Brittonia 2: 163. 1936, has glabrous leaves acute at base. F.M. Negs. 31943; 4368 (*D. glomerata*).

Loreto: Maynas, *Poeppig 2266*, type. Yurimaguas, *Williams 4164; 4263; 4707; Killip & Smith 29054*. Balsapuerto, *Killip & Smith 28438*. Río Mazán, *Williams 8130*. Mishuyacu, *Klug 217*. "Motelomicuna" (Williams).

Diospyros inconstans Jacq. Amer. 276. *pl. 174*. 1763; 127. *Maba inconstans* (Jacq.) Griseb. Fl. Brit. W. Ind. 404. 1864. *D. psidioides* HBK., *D. conduplicata* HBK. Nov. Gen. & Sp. 3: 254. 1819, fide Hiern.

Branchlets and growing parts, including the cymes, more or less rusty or reddish pubescent or the leaves tomentulose, glabrate in age; petioles 5–8 mm. long; leaves oblong-obovate, somewhat narrowed at base and apex or obtuse, 4–16 cm. long, 1.5–7 cm. wide, subcoriaceous, sometimes minutely pellucid punctate, reticulate-veined, midrib depressed above, the margins barely recurved; flowers 3–4-merous, the 3-flowered male cymes drooping, the female soon solitary; male corollas 7–15 mm. long, pubescent without, glabrous (or villous within?), the ovate lanceolate lobes about equaling the tube; calyx pubescent, the lobes as long as or longer than the tube; stamens usually 9 (6–12), unequal, glabrous, distinct in pairs or three together; receptacle pubescent; female corollas at most 8 mm. long, the calyx lobes rounded, puberulous without, tomentulose within, the corolla lobes one-third as long as tube, densely pubescent without; staminodes 3–4; ovary hirsute, 6-celled, 6-ovuled, the fruit depressed globose, lustrous, glabrate, yellowish with black bitter pulp, 8–16 mm. thick, the reflexed or nearly flat fruiting calyx about 15 mm. broad.—Jacquin described male corollas as villous within. Cf. *D. velutina* Hiern under *D. artanthaefolia,* collected on the coast near Guayaquil, Ecuador, but apparently not found in adjacent Peru by Svenson. Illustrated, Mart. Fl. Bras. 7: *pl. 2.* F.M. Negs. 38612; 38716.

Peru (perhaps). West Indies; Colombia to Ecuador; Brazil.

Diospyros opacifolia Macbr., sp. nov.

Ramulis puberulis et ad apicem plus minusve pilis longioribus indutis; petiolis 3–5 mm. longis; foliis oblongis vel elliptico-oblongis basi rotundatis, apice acute subabrupteque acuminatis (acumine ad 1 cm. longo), 12–19 cm. longis, 4–7 cm. latis, tenuiter coriaceis, obscure vel haud nitidis, glabratis, demum glabris, junioribus costa margineque ferrugineo-pilosis, nervis primariis 8–14 utrinque haud prominulis, venulis obscuris; inflorescentiis (masc.) circa 7-floris glomerulosis fusco-strigosis; calyce 4-partito, corolla ut videtur urceolata; staminibus circa 12, antheris pilosis; floribus (fem.) subsessilibus ut videtur, solitariis, calycibus strigoso-sericeis, lobis 4, ovato-lanceolatis, subacutis, circa 1 cm. longis; ovario dense hirsuto. —May be nearest *D. guianensis* (Aublet) Gürke but that has lustrous conspicuously veined leaves; the flowers, unfortunately, are only in bud and in young fruit.

Loreto: Mishuyacu near Iquitos, *Klug 63* (masc.), *362* (fem.), type; also *Klug 125.*

Diospyros Pavonii (A. DC.) Macbr. Candollea 6: 18. 1934; 129. *Macreightia Pavonii* A. DC. Prodr. 8: 222. 1844. *Maba Pavonii* (A. DC.) Hiern, l.c.

Branchlets puberulent; petioles 6 mm. long; leaves oval, obtuse at base, acute, 12–15 cm. long, about 7 cm. wide, except midnerve nearly glabrous above, velutinous beneath, subcoriaceous; male flowers 3-merous, cymose on rusty tomentose peduncles 10–12 mm. long, the pedicels scarcely 2 mm. long; calyx 6 mm. long with ovate acute lobes pubescent on both sides; corolla 10–12 mm. long, rusty sericeous without except at base, glabrous within; female flowers solitary, about 10 mm. long on peduncle 6 mm. long, the deeply divided calyx with 3 oval submucronate lobes.—Type collection, in Herbarium Boissier and Herbarium Prodromus but without data, may be by Sessé and Moçiño and then from Mexico but the Klug specimen seems to represent the species; *D. salicifolia* Humb. & Bonpl., 129, also of uncertain origin and rather similar, has lanceolate-oblong leaves about 7 cm. long, 2 cm. wide. Allied northern Brazil species that may well occur in Amazonian Peru include *D. myrmecocarpa* Mart., 141, and *D. myristicoides* (Hiern) Macbr., 142, both with glabrate leaves; in the former they are narrowly oblong, 3–5 cm. wide, in the latter 2.5–7 cm. wide, the anthers sericeous, 12 in 3-merous, 30 in 5-merous male flowers, the flowers unknown in the Martius' species; see note, *D. pseudoxylopia.* F.M. Negs. 8522; 33869.

San Martín: Juanjuí, *Klug 4270* (det. Standley with query). "Orlaca."

Diospyros peruviana Hiern, Trans. Cambr. Phil. Soc. 12: 253. 1873. *D. peruviana* Hiern, var. *Sprucei* Hiern, l.c.

Growing parts as inflorescences early reddish pubescent; petioles 3–8 mm. long; leaves ovate-oblong, nearly rounded at base, acuminate, 7–15 cm. long, 3–5 cm. wide, coriaceous, deep green, lustrous and glabrous above except the tardily depressed veins, pubescent beneath, especially on the veins and recurved margins; male flowers cymose, white, scentless, crowded on pedicels 2.5–6 mm. long, about 10 mm. long, 5–6-merous, the campanulate calyx pubescent without, its ovate lobes acute, the deeply parted corolla with rounded spreading lobes each with a dense longitudinal stripe of silky reddish trichomes; stamens about 45, the linear anthers pilose, the filaments glabrous, united basally; female flowers in subsessile clusters; fruit subspheroid, 18 mm. in diameter, papillose rugose and reddish setose, rather fleshy, the 7-parted remaining calyx not accrescent, about 12 mm. wide.—Nearly *D. polyandra* Spruce, 251, with, however, subcordate leaves; Sandwith suggested that *D. guatterioides* A. C. Sm. Brittonia 2: 162. 1936, of Brazil, may be the Spruce species; it seems to be even nearer *D. peruviana,* if not the same, but the author distinguished it "by the copious long spreading hairs of the branchlets and nerves of the lower leaf surfaces, and by the obovate-spatulate rather than distinctly oblong corolla lobes." Clearly distinct is *D. longistyla* A. C. Sm. l.c. 161, from the basin of Río Madeira, Brazil, with ample broadly elliptic leaves softly ferrugineous tomentose beneath, female flowers 12–14 mm. long. *Williams 1083* has female flowers with pedicels 5 mm. long, petals nearly glabrous. *D. glomerata* Spruce, 254, of northwest Brazil, has leaves much paler beneath, flowers in axillary sessile clusters, stamens 26–33. Here too would be sought, but unrelated, *D. Krukovii* A. C. Sm., Bull. Torrey Club 60: 390. 1933, recently found as near as São Paulo de Olivença, Brazil, with larger glabrous (nearly) leaves, male flowers scarcely 4 mm. long with 12–15 stamens (Sandwith, Kew Bull. 491. 1949). *Spruce 4411* was a small tree 5 meters tall, not rarely pendulous at top with long subpinnate branches, 5 or occasionally 3 or 4 together (Spruce); a 12-meter tree (Tessmann). F.M. Neg. 22744.

San Martín: Tarapoto, *Spruce 4411*, type; *Ule 6471* (det. Krause); *Williams 6121; 6498.*—Loreto: Soledad, *Tessmann 5173.* Mouth of Río Santiago, *Tessmann 4602.* Manfinfa on the Upper Río Nanay, *Williams 1083?* Brazil? "Ananilla" (Williams).

Diospyros Poeppigiana A. DC. Prodr. 8: 224. 1844; 256.

Flowering branchlets sparsely spreading pilose, soon glabrate; petioles 4–6 mm. long; leaves oblong-lanceolate or somewhat elliptic-oblong, acute or shortly cuneate at base, broadly and obtusely short-acuminate, mostly 7–8 cm. long, 2.5–3.5 cm. wide, or somewhat larger proportionately, early glabrescent or glabrous above except along the depressed midrib, minutely appressed pubescent beneath, obscurely so in age, thin-coriaceous, the many slender lateral nerves and veins faint on both sides or the veins obsolete; male cymes several-flowered, about 5 mm. long, pedicels recurving, 2–3 mm. long, pale pubescent as the 4–5-lobed calyx, the densely tawny strigose corolla about 1 cm. long; stamens 12–20, subequal; anthers hispid, linear, hypogynous, the short glabrous filaments more or less paired at base; fruit globose, more or less pubescent with short appressed trichomes, especially toward the top.—The branchlets (also those of

Poeppig specimen) show a number of long spreading trichomes, especially apically, instead of only appressed pubescence as implied by Hiern. *D. liriosmoides* A. C. Sm. (Brittonia 2: 164. 1936) from the basin of Río Madeira (Brazil), which may not be distinct—leaves 5–6 cm. long, 1.5–2.2 cm. wide, and corolla with somewhat closer pubescence—was a tree 30 meters tall. Williams described it as about 12 meters tall; trunk 3 dm. in diameter; fruit about 2.5 cm. across, the 4 seeds imbedded in a sweet edible pulp; he also noted, as did Spruce, that it grows in non-inundated forest. F.M. Neg. 4370.

Loreto: Río Mazán, *José Schunke 163* (det. Standley, *D. pseudoxylopia* Mildbr.). Palta-Cocha on the upper Río Nanay, *Williams 3196* (det. Standley). Yurimaguas, *Poeppig 2639*, type. Amazonian Brazil? "Uchpa-pamashto" (Williams).

Diospyros pseudoxylopia Mildbr. Notizbl. Bot. Gart. Berlin 10: 194. 1927.

Branchlets subappressed puberulent, the internodes 1.5 cm. long; petioles 3–4 mm. long; leaves subdistichous, elliptic- or slightly ovate-lanceolate, shortly attenuate at base, long- or caudate-acuminate, 6–8 cm. long, 18–25 (30) mm. wide, glabrous above except for sericeous midnerve, densely yellowish sericeous beneath, the lateral nerves scarcely conspicuous; male inflorescence axillary, fasciculate-cymose, to 7-flowered, often 1-flowered, the pedicels 1–2 mm. long; flowers sericeous, the campanulate calyx tube scarcely 3.5 mm. long, the 5 semi-lanceolate acute teeth 3 mm. long; corolla pale yellow, fleshy coriaceous, the teeth 5, the obtuse lobes 5–6 mm. long, 3.5–4 mm. wide; stamens unequal, the 5 longer 6 mm. long, the 10 shorter 5 mm. long, the glabrous filaments 2 mm. long, anthers linear, pilose lower half.—Strikingly resembles some species of *Xylopia* and differs from the Brazilian *D. sericea* A. DC., l.c. 140, in the long-acuminate leaves and smaller flowers with fewer stamens (Mildbraed). Type from tree 20 meters high, trunk 5 dm. in diameter, 12 meters to first branch. Similar species to be expected include *D. myrmecocarpa* Mart. (*D. myristicoides* (Hiern) Macbr.; cf. Sandwith, Kew Bull. 492. 1949), the leaves mostly 10–14 cm. long, about 4 cm. wide, and acutely but shortly acuminate, lightly pubescent or glabrate beneath. *D. micrantha* Sandw. l.c. 491, with similar leaves and indument, has petioles about 1.5 mm. long, male flowers only to 3 mm. long, the stamens subequal; type from São Paulo de Olivença, Brazil; to be expected of course in Peru; it may resemble Mildbraed's species more closely than indicated, but it was not seen by me. *D. guianen-*

sis (Aubl.) Gürke, 240, widely distributed in the Amazon regions, has acuminate leaves 7–18 cm. long, 2.5–3.5 cm. wide, often glabrate beneath, 4-merous flowers. F.M. Neg. 4372.

Loreto: Flood-free wood below Pongo de Manseriche, Puerto Melendez, *Tessmann 4784*, type. Brazil.

Diospyros subrotata Hiern, Trans. Cambr. Phil. Soc. 12: 250. 1873. *D. amazonica* Krause, Verhandl. Bot. Ver. Brandenb. 48: 193. 1907, in part.

Younger parts with a pale appressed pubescence, glabrescent except the leaf-nerves and open (male) cymes, these to 1 (or even 2 in Peru) cm. long, more or less canescent with short appressed trichomes, the pedicels to 3 mm. long; petioles distichous, about 5 (–10) mm. long; leaves oval-elliptic, subcordate at base (or rounded), more or less acuminate, thin-coriaceous (or chartaceous), the midnerve and principal lateral nerves impressed above, prominent, with the veins beneath, in type 7.5–17 cm. long, nearly half as wide, in Peru 10–13 cm. long, about half as wide; flowers 5–6-merous, the openly campanulate calyx lightly pubescent, the subrotate corolla nearly 12 mm. across, its oval spreading convex lobes 5 mm. long, with longitudinal stripe of appressed trichomes (this only toward base in Peru); stamens about 20, the anthers pilose; fruiting pedicels short or about 1 cm. long, the subrotund sparsely pubescent fruit about 2.5 cm. in diameter.—To 13 meters tall (Tessmann); type not seen and variances for the Peruvian specimens noted in parentheses above. Sandwith, Kew Bull. 490, 1949, considered the apparent differences between the proposed species of Krause and this as variable. *D. Duckei* Sandw. l.c. 488, somewhat similar, has smaller, less rotate corollas, and has the stamens, except 1, medially inserted. F.M. Neg. 4366 (*D. amazonica*).

Loreto: Near mouth of Río Tigre along Río Marañón, *Killip & Smith 27515* (young state?). Mishuyacu near Iquitos, *Klug 647; 833.* Mouth of Río Santiago, *Tessmann 4396* (det. Krause, *D. amazonica*). Amazonian Brazil.

Diospyros Tessmannii Mildbr. Notizbl. Bot. Gart. Berlin 10: 195. 1927.

Slender, entirely unbranched tree, the type 1.5 meters tall, glabrous except the yellowish green flowers, the known male ones 4-merous and about 7 subsessile in axillary glomerules; petioles about 1.5 cm. long; leaves oblong or lanceolate-oblong, rounded or shortly attenuate at base, shortly and obtusely acuminate, 21–30 cm. long, 6–9 cm. wide, the midnerve canaliculate above, the primary lateral nerves 15–20, the veins laxly reticulate; calyx minutely puberulent, broadly cupulate, the acute teeth 2–2.5 mm. long, the sinuses open; corolla subhypocrateriform, the densely sericeous tube 7 mm. long, the lower third little enlarged, about 2.5 mm. across, the reflexed glabrous lobes broadly cordate, 3.5 mm. long and broad, their tips apiculate; stamens 9, of which 8, 1 short, 1 long, are paired; filaments glabrous; anthers long-pilose below.—Unique among tropical American species and typical of slender growths in weak light of dense woods (Mildbraed). *D. tenuiflora* A. C. Sm. Journ. Arnold Arb. 20: 301. 1939, of the upper Amazon, differs by its shorter petioles (5–10 mm.), its leaf pubescence, its 9–12 secondary nerves and its slightly longer sparsely pubescent corollas; and similar to the Smith species is *D. santaremnensis* Sandw. Kew Bull. 482. 1949, but leaves acutely cuneate at base, reticulation less intricate, less prominent, flowers many, corolla lobes twice as broad. These species appear to form a distinct group in Hiern's section *Paralea*, differing, it is said, from *D. guianensis* (Aubl.) Gürke in many details of pubescence and in leaf texture; cf. *D. guianensis* also under *D. pseudoxylopia*. *D. Sprucei* Hiern, 210, of Colombia, has elegantly acuminate-caudate leaves reddish tomentose beneath, 16 glabrous stamens. F.M. Neg. 4373.

Loreto: Mouth of the Río Santiago, flood-free wood, *Tessmann 4635*, type.

SYMPLOCACEAE [D. Don] Dumort.

Reference: Brand, Pflanzenreich IV. 242. 1901.

Shrubs or trees with simple alternate sessile or shortly petioled leaves, often lustrous above, and axillary or terminal sessile or peduncled usually hermaphrodite flowers that are solitary, fasciculate or sometimes spicate or racemose. Calyx lobes valvate, 5, the longer 3–11 petals more or less connate. Stamens 4-many in 1–4 series, free or more or less coalescent, inserted on the corolla, the anthers subglobose, 2-celled. Ovary inferior or partly so, 2–5-celled; ovules 2–4, pendulous; style slender. Fruit baccate or drupaceous, crowned by the calyx lobes, 1–5-celled, the seeds solitary in each cell, the endosperm abundant.

SYMPLOCOS Jacq.

The known species are conveniently treated as constituting a single genus although in accord with segregation as accepted traditionally in related groups it would be possible or logical to recognize several "genera." Brand helpfully gave both a vegetative and a systematic key and from his work I have largely compiled. With accumulation of more collections many of the proposed species will probably be found to be parts of more or less variable entities.

A tea is commonly brewed from the leaves; Bonpland in Humb. & Bonpl., Pl. Aequin. 1: 184–185. 1808, recommended highly a Colombian species, *S. theiformis* (L. f.) Gürke—not unlike *S. arechea* of Peru—as an aid when chilled and threatened with colds. *S. racemosa* Roxb. of India provides "Lodh Bark."

Leaves small, rarely if ever 2 cm. long.

  Branchlets somewhat reddish hirsute.................. *S. nana.*

  Branchlets glabrous.

    Leaves sessile, denticulate....................... *S. sandiae.*

    Leaves subsessile, entire......................... *S. compacta.*

Leaves about 3.5 cm. long, usually much longer.

  Leaves mostly or all shorter than 8 cm.

    Branchlets glabrous.

      Flowers in subumbellate panicles; leaves cordate, sessile. *S. lugubris.*

      Flowers subspicate; leaves oblong, petioled..... *S. bogotensis.*

      Flowers solitary (rarely fasciculate); leaves narrowed at base.

        Leaves denticulate; flowers axillary.

          Leaves sessile.......................... *S. Baehnii.*

          Leaves petioled......................... *S. cernua.*

        Leaves entire; flowers extra-axillary...... *S. extraaxillaris.*

    Branchlets hirsute or pilose at least toward tips.

      Leaves sessile or subsessile, merely undulate-margined or subentire.

        Panicles longer than obovate leaves, these finely reticulate. *S. tristis.*

        Panicles shorter than oval or suborbicular leaves, these coarsely veined beneath............. *S. Weberbaueri.*

      Leaves petiolate, dentate or serrate-crenate.

        Leaves obscurely serrate-crenate, 6–8 cm. long... *S. Mezii.*

        Leaves glandular-denticulate, 2.5–4.5 cm. long... *S. alpina.*

  Leaves mostly or all longer than 8 cm.

Petioles lacking or scarcely obvious.
  Leaves serrate, hirsute beneath; ovary pilose.....*S. colorata.*
  Leaves subentire, puberulent or pilose beneath; ovary glabrous.
    Leaves oval or broadly elliptic...............*S. coriacea.*
    Leaves oblong-obovate..................*S. melanochroa.*
Petioles at least several mm. long.
  Branchlets glabrous; leaves entire.
    Leaves mostly longer than 11 cm.; corolla lobes 4–5, nearly free..............................*S. Spruceana.*
    Leaves mostly or all shorter; corolla lobes 6.....*S. apolis.*
  Branchlets hirsute or pilose or if glabrous the leaves not entire.
    Leaves coarsely and prominently reticulate-veined at least beneath, scabrous or pubescent.
      Petioles 5–8 mm. long; leaves scabrous beneath. *S. scabra.*
      Petioles 1–2 cm. long; leaves tomentulose beneath. *S. patazensis.*
      Petioles 3–4 mm. long; leaves pilose-tomentose beneath (*S. Mezii?*).......................*S. melanochroa.*
    Leaves obscurely or finely veined beneath, glabrous or glabrate, puberulent or lightly pilose on nerves.
      Leaves denticulate, sometimes minutely.
        Leaves rounded at base; stamens biseriate..*S. arechea.*
        Leaves more or less cuneate at base; stamens 3–4-seriate. *S. sylvicola, S. Matthewsii.*
      Leaves entire or obscurely or repand-dentate. *S. peruviana.*

Symplocos alpina Brand, Repert. Nov. Sp. 2: 13. 1906.

Branchlets ferrugineous, the coriaceous obtuse or acutish elliptic leaves glandular denticulate to the cuneate base, glabrous above, hirtellous beneath, 3.5–4.5 cm. long, 2–2.5 cm. wide; racemes about 4-flowered, subequaling the petiole; bracts minute, ciliate; calyx glabrous except for the ciliate rounded spreading lobes that about equal the tube, the corolla scarcely twice as long, roseate-green, connate to one-third, (5-) 6-parted; stamens long-connate, biseriate, included; ovary 3-celled, white-tomentose; fruit cylindric, 10 mm. long, black, the spreading calyx lobes exceeding the disk.—Placed by author next to *S. Mezii*. *S. quitensis* Brand, 76, is like *S. cernua* but has glabrous corolla, pilose branchlets. F.M. Neg. 4331.

Huánuco: Among shrubs, Monzón, 3,400 meters, *Weberbauer 3345*, type.—Huancavelica: Near Surcubamba, *Stork & Horton 10375*.

Symplocos apolis Brand, Ann. Conserv. & Jard. Bot. Genève 15: 343. 1913.

Glabrous except the ciliate rounded calyx lobes, these equaling the tube and the villous 3-celled ovary, the branches gray, the foliage drying dark; petioles about 1 cm. long; leaves broadly obovate, cuneate at base, rounded or shortly apiculate, entire, thin-coriaceous, lustrous above, brown beneath, 8–11 cm. long, 5–7 cm. wide, the midrib impressed above, the secondary nerves distinct on both sides; spikes little exceeding the petioles; corolla 4 times longer than the calyx, the 6 petals one-third connate; stamens long-connate, 4-seriate; style much longer than calyx.—Type in Herbarium Delessert from "Nov. Hisp." under an ined. name. Brand remarked that the habit resembles Peruvian more than Mexican species and places it next to *S. quindiuensis* Brand, 77, of Colombia. F.M. Neg. 26713.

Peru(?): *Pavón*, type.

Symplocos arechea L'Hér. Trans. Linn. Soc. 1: 176. 1791; 84. *Praealstonia arechea* (L'Hér.) Miers, Journ. Linn. Soc. 17: 291. 1880.

Branchlets hirsute; leaves oblong-elliptic, rounded or retuse at base, obtusely acuminate, 10–14 cm. long, 5–6.5 cm. wide, denticulate, slightly puberulent beneath, membranous; racemes few- (1–5-) flowered, often 2–3-forked at base, a little longer than the petioles, these about 8 mm. long, glabrous; corolla 5–6 times longer than the calyx, about 1 cm. long, connate to about the middle; bracts sericeous, shorter than the calyx; style hirsute below, the (3–4-) 5-celled ovary densely white-villous; stamens biseriate, long-connate; fruit about 2 cm. long, glabrous, the ciliate calyx lobes longer than the disk.—A specimen by Poeppig purporting to have come from northern Chile was probably misdetermined or mislabeled. F.M. Neg. 4335 (Poeppig).

Huánuco: In woods, flowering in July, Pampayacu, *Poeppig 6, 43, 1464; Kanehira 56*. Without locality, in woods, *Dombey*, type. "Arechea."

Symplocos Baehnii Macbr., sp. nov.

Ramuli glabri; folia oblongo-ovata apice acuta vel brevissime acuminata, basi angustata, sessilia, margine dimidio superiore dentata, dimidio inferiore integra, utrinque glaberrima, 6–8 cm. longa, 2.5–3.5 cm. lata; flores 10–12 mm. longae, solitarii, axillares; pedicelli 10–14 mm. longi, glabri, reflexi; bracteae 4 (an semper?) ut calycis lobi, glaberrimae; petala 5, reflexa, basi cum staminorum tubo cohaerentia; tubus 2–3 mm. longus, filamenta libera aequilongior vel brevior; filamenta complanater, 3–4 mm. longa; ovarium glaberrimum, 3-loculare; stylus 3 mm. longus; fructus ignotus.—Ex affinitate *S. reflexae*, sed a foliis dentatiis et magnitudiae florum facile distincta.

Species worked out by my friend Ch. Baehni and description drawn by him about 1937.

Junín: Vitoc, *Ruiz & Pavón*, type, Herb. Madrid.

Symplocos bogotensis Brand, Pflanzenreich IV. 242: 30. 1901.

Glabrous; leaves oblong-elliptic, rather long-apiculate, 2.5–3.5 cm. wide, mostly 5–8 cm. long; flowers subspicate, the spikes twice as long as the petioles; calyx with 5 lobes half again longer than the tube, the corolla twice longer than the calyx; stamens in male flowers about 20; fruit unknown.—Apparently scarcely distinct from *S. revoluta* (Mart.) Casar., 29, of central Brazil with obtuse or shortly apiculate leaves, calyx lobes little longer than tube, stamens about 15, in hermaphrodite flowers only 5; fruit black, subglobose, glabrous, about 5 mm. long, the calyx lobes exceeding the disk. In view of the close relationship either or both forms may be expected to meet or occur in Peru. F.M. Neg. 26714.

Amazonas: Molinopampa, *Weberbauer 4334; 4335*. Colombia; Brazil?

Symplocos cernua Humb. & Bonpl. Pl. Aequin. 1: 188. *pl. 53.* 1808; 77. *Praealstonia cernua* (Humb. & Bonpl.) Miers, Journ. Linn. Soc. 17: 292. 1880.

Branchlets apically obsoletely angled, very leafy, glabrous; leaves oblong-elliptic, narrowed at base, shortly acute or apiculate, 5–7 cm. long, 2.5–3 cm. wide, more or less denticulate above the middle, coriaceous, lustrous, paler beneath where ciliate-pilose on the midnerve; flowers solitary on nodding peduncles a little shorter than the petioles, these 7–9 mm. long; bracts 4–6, sericeous as the white rotate corolla without, its cylindric tube very short, its limb with 5 outer oval divisions and about 6 shorter and narrower inner ones; calyx tube villous, a little shorter than the sericeous lobe; ovary pilose, 3-celled(?); stamens about 30 in 3 series, the extremely short filaments joined at base; fruit unknown.—*S. reflexa* A. DC., 77, Ecuadorian, is similar but has quite glabrous leaves scarcely narrowed at base, elongate peduncles. Here also would be sought *S. Pavonii* Brand, 75, of Ecuador, with sessile or fasciculate flowers, ovary nearly glabrous.

The type of *S. cernua* according to the authors was from a much-branched tree 10 meters tall, the straight trunk 3 dm. in diameter at 3–4 meters, with very thick brown creviced bark; foliage a beautiful green, the tree worthy of cultivation, the wood said to be very heavy and hard.

Cajamarca: In woods at 600 meters, near Jaén de Bracamoros, *Bonpland*, type.

Symplocos compacta Macbr. Candollea 5: 399. 1934.

Densely branched shrub, the branches stout, the densely leafy and verruculose branchlets fastigiate and incurved-ascending; leaves entire, elliptic-oval or oblong-elliptic, gradually narrowed to the very short petiole, obtuse or sometimes minutely retuse, 10–12 mm. long, 5–6 mm. wide, coriaceous, pale green and slightly lustrous above, the veins impressed, dark green (drying brown) and evenose beneath; flowers solitary but crowded toward the branchlet tips, pedicels compressed-angulate, 5 mm. long; bracts unequal, the larger 7 mm. long, mucronate and glandular-ciliate; petals nearly free, obovate, about 7 mm. long, minutely denticulate, the filaments longer than the tube, 1.5 mm. long; style glabrous.—Among Peruvian species suggests *S. nana* and *S. sandiae*, both with crenate or denticulate leaves, the former with shorter entire petals. *S. theiformis* (L. f.) Gürke, 81, of Colombia, has minutely crenulate leaves.

Huánuco: Río Pozuzo, *Weberbauer 6731*, type.

Symplocos colorata Brand, Pflanzenreich IV. 242: 74. 1901.

Closely allied to *S. tristis* and similar but leaves subsessile, variable, oval, elliptic or oblong, serrulate, rounded at base, shortly or barely acuminate, reddish-hirsute beneath, 8–12 cm. long, 4–6 cm. wide; bracts villous; calyx tube glabrous, the sericeous rounded lobes somewhat longer, the white corolla twice as long, 6-parted; stamens triseriate, scarcely exserted; fruit black, globose.—Quite possibly in Peru the "Huoycani" of Pearce perhaps meant for Huancayo.

Peru (possibly). Bolivia.

Symplocos coriacea A. DC. Prodr. 8: 248. 1844; 74. *Praealstonia coriacea* (A. DC.) Miers, Journ. Linn. Soc. 17: 292. 1880.

Branchlets rusty tomentose; leaves subsessile, subentire, oval or elliptic, subcordate at base, obtuse, 8–10 cm. long, 5–6 cm. wide, glabrous above, somewhat puberulent beneath; flowers in axillary racemes or panicles, fulvous tomentose except for the glabrate ovate bracts or the corollas, these little known but said to be two or three times longer than the calyx; ovary 3-celled, glabrous; style claviform; fruit ampulliform, 13 mm. long, the comose calyx lobes exceeding the disk.—F.M. Neg. 7516.

Huánuco: Pillao, *Pavón*, type in herb. Boissier.

Symplocos extraaxillaris Brand, Bot. Jahrb. 54. Beibl. 117: 80. 1916.

Shrub with purplish angulate branchlets, glabrous except the ciliate bracts, calyx lobes, and sericeous ovary; leaves subsessile, drying yellowish, coriaceous, lustrous above, whitish-green beneath, elliptic or oblong, cuneate at base, obtuse or barely acuminate, 4.5–5.5 cm. long, 2–2.5 cm. wide, entire, the nerves impressed above, densely reticulate beneath; flowers solitary, extra-axillary on very short thick clavate peduncles; bracts and calyx lobes broadly ovate, the latter slightly longer than the tube; corolla greenish-white, one-third connate, the 5 spreading petals about twice as long as the calyx; stamens many, connate above the middle, 4-seriate; ovary 3-celled, the style claviform.—Two meters high. Near to *S. cineraea* Brand, Repert. Nov. Sp. 2: 14. 1906, of Colombia, which is near *S. parvifolia* Benth., of Ecuador, with crenate leaves.

Piura: Northwest of Huancabamba in shrub-tree formation, 2,800 meters, *Weberbauer 6340*, type.

Symplocos lugubris Brand, Pflanzenreich IV. 242: 75. 1901.

Glabrous except sparsely pilose leaf-nerves beneath, the ciliate bracts and the white tomentose ovary; fruit unknown; leaves sessile, ovate, cordate at base, obtuse, 5–6 cm. long, 3–4 cm. wide, coriaceous, lightly undulate-margined, equaled or exceeded by the terminal subumbellate panicles; calyx lobes rounded, shorter than the tube, the twice as long 6-parted corolla one-fourth connate, the long-connate stamens nearly exserted; style short, claviform; ovary 3-celled.

Amazonas: Chachapoyas, *Mathews*, type in herb. Kew.

Symplocos Matthewsii A. DC. Prodr. 8: 250. 1844; 86. *Praealstonia Matthewsii* (A. DC.) Miers, Journ. Linn. Soc. 17: 292. 1880.

Branchlets lightly pilose or glabrate; leaves obovate-oblong, obtuse or apiculate, cuneate at base, 8–11 (13) cm. long, 2.5–3.5 (5) cm. wide, coriaceous, denticulate, caducously pilose beneath; racemes divided, 3–5-flowered, rather longer than the petioles, these 8 mm. long; calyx lobes 5, ciliate, rounded, subequaling the tube, the corolla 3–4 times longer, 10–12 mm. long, connate about to the middle; stamens triseriate, connate into a long tube 1–3 times longer than the filaments; style glabrous; fruit unknown.—F.M. Neg. 4352.

Peru: *Matthews 2016*, type in herb. Webb. Bolivia (according to Rusby).

Symplocos melanochroa Sleumer, Repert. Nov. Sp. 42: 265. 1937.

Branchlets and leaves beneath, especially on the midnerve and nerves, densely rust-red tomentose; petioles 3–4 mm. long; leaves obovate-oblong, obtusely subacuminate at the broadly attenuate tip, broadly narrowed to the base, 10–14 cm. long, 3.5–5.5 cm. wide, chartaceous, entire or obscurely serrulate, glabrous in age or nearly above, the midnerve and laxly reticulate veins there impressed; racemiform panicles 2–4 cm. long, densely tomentose even to the subpersisting calyx lobes and fruit, this 7 mm. long, 5–6 mm. thick; peduncles 2–3 (5) mm. long, the 2–4 flowers (corollas unknown) on pedicels 1–2 mm. long; calyx lobes 4 or 5, ovate, 1.5 mm. long.—Allied by author to *S. serrulata* Humb. & Bonpl. of Colombia, 80, but with denser leaf pubescence, marked leaf-reticulation and pedicelled flowers. Two meters high, the flowers violet (Weberbauer).

Cuzco: Above Cosnipata, Tambo Mayo to Tres Cruces, Prov. Paucartambo, *Weberbauer 6970*, type.

Symplocos Mezii Szyszyl. Dissert. Classis Math.-Phys. Acad. Litt. Cracov. 29: 230. 1895; 75.

Branchlets reddish-hirsute; leaves elliptic-oblong, ovate both ends, 6–8 cm. long, 2.5–3 cm. wide, coriaceous, pilose beneath, indistinctly serrate-crenate; axillary peduncles about 3-flowered with 5 ovate acute bracts, these white-tomentose as also the calyx lobes and 5-parted corolla; fruit unknown.—Not seen by Brand but allied by him to *S. lugubris* and therefore presumably with long-connate stamens and 3-celled ovary. Type locality written "Schauyn" by Brand, doubtless for Jaén, where Jelski obtained many of his plants. Cf. *S. peruviana*.

Cajamarca: Jaén, *Jelski 265*, type.

Symplocos nana Brand, Pflanzenreich IV. 242: 76. 1901.

Densely leafy branchlets more or less sordidly reddish-hirsute; leaves sessile, ovate, crenate with about 5 crenations both sides, rounded both ends, glabrous, coriaceous, 10–12 mm. long, 6 mm. wide; flowers solitary, sessile or subsessile, bracts rotund, ciliate; calyx glabrous, the rounded imbricate lobes somewhat longer than the tube; corolla undeveloped but petals entire, 3.5 mm. long; stamens 4-seriate, style glabrous, ovary minutely white pilose; fruit unknown.—Author groups with *S. cernua;* the ovary thus probably 3-celled, the stamens long-connate but free above. Type was possibly from Bolivia, as Brand suggests. The Ecuadorian *S. parvifolia* Benth., 76, has shortly petioled leaves 1.5–3 cm. × 1.5–2 cm., denticulate, the calyx lobes hirsute.

Huánuco: Río Manseriche, 3,400 meters, *Weberbauer 6642.* Puitar, 400 meters, (*Pearce,* type without complete data in herb. Kew).

Symplocos patazensis Mansf. Notizbl. Bot. Gart. Berlin 9: 468. 1925.

Younger branchlets, leaves, especially the petiole and the prominent nerves beneath and the rachises rusty tomentulose; petioles 1–2 cm. long; leaves broadly elliptic or ovate, 6–12.5 cm. long, 4–6.5 cm. wide, glabrous above except midnerve, nerves impressed, acute or subrounded at base, shortly acuminate or obtuse, dentate or subentire; panicles 4–8 cm. long, often subumbelliform, the sessile flowers glomerate at branchlet tips; calyx 3 mm. long, the 5 ovate sepals tomentulose basally and marginally, glabrous within; stamens triseriate (35–40), the filaments connate at base subequaling the 5 ovate glabrous petals, these 3.5 mm. long, connate for 1 mm.; ovary 4–5-celled, densely pilose.—Near *S. lugubris* Brand, *S. umbellata* Brand and *S. Weberbaueri* Brand, all with cordate leaves and glabrous calyces. Four meters high, the flowers white. F.M. Neg. 4404.

La Libertad: Prov. Pataz, valleys of the Mixiollo, 3,000 meters, *Weberbauer 7033,* type.

Symplocos peruviana (Szyszyl.) Brand, Pflanzenreich IV. 242: 89. 1901. *S. lanceolata* (Mart.) A. DC. var. *peruviana* Szyszyl. Dissert. Classis Math.-Phys. Acad. Litt. Cracov. 29: 231. 1895.

Branchlets shortly appressed pilose apically; leaves obsoletely crenate, coriaceous, under lens pilose beneath, midrib impressed above, obovate-oblong, rounded-acute at base, obtusely acuminate, 8.5–9.5 cm. long, 4–4.5 cm. wide; inflorescence simple or compound, 2–3 times longer than the petioles, 5–10-flowered; flowers sessile, the bracts and calyx white sericeous, the rotund lobes of the latter subequaling the tube; corolla glabrate, twice as long as the calyx, 5–6 parted nearly to the base; stamens many, coalescent basally, the filaments under lens glandular; short style and 3-celled ovary white villous; fruit unknown.—Unique in glandular filaments (Brand). F.M. Neg. 4357.

Cajamarca: Jaén, *Jelski 266*, type.

Symplocos sandiae Brand, Repert. Nov. Sp. 14: 324. 1916.

Shrub to 1 meter high with ashy verrucose bark; leaves sessile, coriaceous, minutely denticulate with about 10 teeth on each edge, ovate, acute, cuneate at base, 15–18 mm. long, 5–8 mm. wide; flowers sessile in few-flowered fascicles; bracts rotund ciliate, calyx glabrous except the rounded ciliate lobes, these longer than the tube, the 5-parted glabrous corolla three times longer; stamens 4-seriate, long connate but free above; ovary sparsely pilose usually or always 3-celled (?).—Near *S. suaveolens* Kl. & *S. rigidissima* Brand of Colombia and Venezuela but the leaves much smaller (Brand). *S. theiformis* (L. f.) Gürke, 81, Colombia, is rather similar but corolla 8–10-parted, ovary glabrous. Flowers fragrant, white.

La Libertad: Near Tayabamba, Prov. Pataz, *Weberbauer 7024*. —Puno: In open shrub formation, 3,100 meters, Sandía, *Weberbauer 741*, type.

Symplocos scabra Macbr. Field Mus. Bot. 8: 128. 1930.

Densely branched shrub to 7 meters high, the younger branchlets densely appressed rusty strigose-hispid, finally merely scabrous-puncticulate; petioles 5–8 mm. long; leaves oblong- or ovate-elliptic, cuneate or sometimes subrounded at base, more or less narrowed at the obtuse tip, mostly 8 cm. long, 3.5–4 cm. wide, chartaceous-coriaceous, glabrous above except for a minute and sparse scabrosity, puberulent beneath and, especially on the nerves, scabrous-pubescent, glandular-serrulate nearly to base, the nerves scarcely obvious above but strongly reticulate beneath; racemes axillary and extra-axillary, 2 cm. long, 1–3-flowered (corollas unknown); pedicels 2–5 mm. long; fruit glabrous, 11 mm. long, 6 mm. thick.—Cf. with *S. Lehmannii, S. tristis, S. coriacea, S. Mezii.*

Huánuco: Wet, rocky, more or less wooded uplands, Tambo de Vaca, *4898*, type.

Symplocos Spruceana (Miers) Gürke in Engl. & Prantl, Pflanzenfam. 4, Abt. 1: 170. 1890; 28. *Barberina Spruceana* Miers, Journ. Linn. Soc. 17: 295. 1880.

Small glabrous tree with submembranous oblong-elliptic entire shortly acuminate leaves, cuneate at base, 11–16 cm. long, 7–9 cm. wide, the costa above at base impressed, rather prominent toward the tip; flowers in many-flowered spikes half as long as the petioles; calyx lobes lanceolate, acute, scarcely as long as the tube; corolla white-green, 5- (4-) parted nearly to base, fragrant, twice as long as the calyx; stamens free, in the male about 25, barely exserted; style and ovary (3-celled) glabrous.—Description largely after Brand; according to Miers, who gives the type number as *Spruce 4865*, the calyx and corolla are 4-parted, the stamens 12; however, the flowers are polygamo-male. The female, fide the author, is larger and solitary in the axils. This is the only known Peruvian species of the subgenus *Epigenia* characterized by free or many stamens. The related *S. bogotensis* Brand, 30, has leaves 2.5–3.5 cm. wide, spikes longer than the petioles, stamens about 20. F.M. Neg. 22945.

San Martín: Tarapoto on top of Mount Pingabu, *Spruce 4845* (cf. note above), type. San Roque, *Williams 7433*. Zepelacio, *Klug 3624* (det. Standley, *S. arechea*).

Symplocos sylvicola Sleumer, Repert. Nov. Sp. 45: 19. 1938˙ *S. longiflora* Brand, var. *moyobambensis* Brand, Repert. Nov. Sp. 2: 14. 1906?

Branchlets terete, the older glabrous; petioles 5–6 mm. long; leaves oblong, obviously cuneate at base, gradually acuminate, the tips sometimes curved and 1–1.5 cm. long, glabrous except the laxly appressed pilose nerves beneath, drying yellowish, little lustrous above, 11–16 cm. long, 3.5–5.5 cm. wide, regularly subserrate-dentate, the teeth glandular-apiculate; racemes 5–7-flowered at the axils of fallen leaves, the rachis 5–6 mm. long, densely yellowish strigose-pilose as also the pedicels, these about 2 mm. long, the nearly glabrous calyx (2–2.5 mm. long) subtended by several pilose bracts, its ciliate lobes half as long; corolla 12–13 mm. long, 4-lobed to middle; stamens 3–4-seriate, long-connate; style equaling corolla, pilose below, the ovary densely so.—Next to *S. arechea* L'Hér., from which it differs in the 3–4-seriate stamens, cuneate-based leaves, smaller flowers (Sleumer). An 8-meter tree with fragrant whitish flowers. *S. castanea* Brand, l.c. 14: 324. 1916, of Bolivia, has much longer petioles, 5-parted corollas, glabrous style. Fruit of Weberbauer specimen is cylindric, black, 15 mm. long, the calyx lobes not or scarcely longer than the disk. F.M. Neg. 4350.

Loreto: Balsapuerto, *Klug 2961; 3001* (both det. Sleumer). Moyobamba, *Weberbauer 4525?* (type, *S. longiflora* var. *moyobambensis*). Ecuador.

Symplocos tristis Brand, Pflanzenreich IV. 242: 74. 1901.

Branchlets reddish-hirsute; leaves sessile, lightly undulate or subentire, 5–7 cm. long, 3–4 cm. wide, pilose only beneath; flowers panicled, sessile and crowded at tips of pedicels, the inflorescences longer than the leaves and with triangular bracts that are sericeous at base as is also the calyx tube, its longer lobes glabrous, the corolla 2–3 times longer; style short, claviform; stamens long-connate, free above; fruit globose or ampulliform, apparently black (immature).—F.M. Neg. 29715.

Junín: Vitoc, *Pavón 143*, type herb. Boissier.

Symplocos Weberbaueri Brand, Repert. Nov. Sp. 2: 13. 1906.

Branchlets and leaves beneath on nerves rusty pilose; leaves subsessile, fleshy coriaceous, glabrous above, oval or suborbicular, lightly undulate, cordate at base, obtuse, 3.5–4.5 cm. long, 2.5–3.5 cm. wide; panicles ferrugineous, terminal, shorter than the leaves, sessile, subumbellate, the bracts villous; calyx glabrous, the broadly rotund lobes shorter than the tube, the twice as long corolla glabrous, roseate-white, 6-parted, one-third connate, the 3-seriate long-connate stamens somewhat shorter; ovary whitish-tomentose, 3-celled(?).—Very near *S. lugubris* (Brand). About 1 meter tall, in montaña.

Junín: At Huacapistana near Tarma, 3,000 meters, *Weberbauer 2069*, type.

STYRACACEAE [L. C. Rich.] A. DC.

Reference: Perkins, Pflanzenreich IV. 241. 1907.

Trees or shrubs, the growing parts usually more or less covered with a close often stellate-lepidote, sometimes tomentose indument. Leaves alternate, simple, exstipulate. Flowers actinomorphic, often racemose, white. Calyx gamosepalous, more or less adnate to the 3–5-celled ovary, the ovules 1–many in each cell and affixed to the inner angle, anatropous. Corolla usually gamopetalous, the lobes valvate or imbricate, usually 4 or 5 (4–7), the stamens as many or twice as many affixed at base and more or less connate; anthers introrse, 2-celled, longitudinally dehiscent. Fruit drupaceous, sometimes capsular and dehiscing irregularly or 5-valved, the calyx persistent, the seed with abundant endosperm and little (if at all) curved embryo.

STYRAX L.

Strigilia Cav. Diss. 7: 358. *pl. 201.* 1789. *Foveolaria* R. & P. Prodr. 57. *pl. 9.* 1794. *Tremanthus* Pers. Syn. 1: 467. 1805.

The only genus in Peru and characterized particularly by 10 stamens, a slender style with capitate or 3-lobed stigma, 3–many-ovuled early 3-celled ovary and a 1- or rarely 2-seeded drupaceous fruit.—The other American genus, *Pamphilia* Mart. of southern Brazil, is similar but has 5 stamens. Miss Perkins' revision, while careful, seems to err in the direction of over-discrimination, admitting for little or no variation; however, with the small amount of material available to me my judgment may be wrong. Under the circumstances revaluation of my own species has not been possible.

Economic products include "Gum Benzoin" from *S. benzoin* Dryand and "Storax" from *S. officinale* L.

Indument (if present) of leaves beneath, at least between the nerves, lepidote, or more prominently lepidote than stellate.
  Leaves ovate-oblong, often shorter or little longer than 1 dm.; flowers (types) racemose....... *S. Mathewsii, S. peruvianus.*
  Leaves broadly ovate or elliptic, often ample; flowers often, in part at least, paniculate.
    Indument persistently conspicuous even on leaves, at least beneath.
      Leaves 10–15-nerved, often shortly but clearly acute or acuminate (species probably variants of one).
        Indument of mature coriaceous leaves silvery-brown or -reddish beneath......... *S. Weberbaueri, S. cordatus.*
        Indument of mature papyraceous leaves silvery... *S. ovatus.*
      Leaves 8–10-nerved, apiculate or merely acutish at the rounded tip................................ *S. argyrophyllus.*
    Indument lacking on leaves beneath unless on the midnerve. *S. Pavonii.*
Indument of leaves beneath stellate- or simple-tomentulose at least between nerves, rarely sometimes also somewhat lepidote.
  Lepidote trichomes obvious on leaves beneath........ *S. socialis.*

Lepidote trichomes lacking on leaves unless on the nerves, or not obvious.

Leaves rather ovate-oblong, small; all, mostly or many about 1 dm. long or shorter.

Leaves fleshy coriaceous, barely acute; flowers subsessile, strictly racemose........................*S. Foveolaria.*

Leaves chartaceous or subcoriaceous, acute or acuminate; flowers somewhat paniculate or pedicellate.

Pedicels to 12 mm. long, more or less panicled.

Corollas about 17 mm. long............*S. Poissonianus.*

Corollas 10–12 mm. long.....................*S. ferax.*

Pedicels to 5 mm. long, often racemose.....*S. tarapotensis.*

Leaves rather broadly elliptic-oblong, sometimes narrowed at base, often ample; usually all or many about 1.5 dm. long or longer.

Indument compactly stellulate on leaves beneath including the nerves or on these furfuraceous.........*S. oblongus.*

Indument nearly or quite lacking on leaf-nerves beneath or laxly hispidulous-stellate.

Nerves and veins of leaves beneath glabrous or nearly. *S. Tessmannii.*

Nerves and often veins of leaves beneath hispidulous-stellate.............................*S. heteroclitus.*

Styrax argyrophyllus Perk. Repert. Nov. Sp. 2: 18. 1906; 66.

Branchlets quadrangular, yellowish silvery lepidote as also the 1.5–2.5 cm. long petioles, leaves beneath (the scales there very minute), and 3–8 cm. long racemes including the flowers; leaves broadly oblong or oval, cuneate-rounded or rounded at base and apex or rarely subacute, 8.5–14 cm. long, 5.5–8.5 cm. wide, coriaceous, entire, sparsely lepidote above, the 8–10 lateral nerves and loosely reticulate veins prominent only beneath; bracts and bractlets minute, linear; pedicels 3 mm. long or longer; calyx papyraceous, 5 mm. high, 4 mm. broad, sericeo-pilose within; corolla lobes valvate, membranous, oblong, about 4 mm. long, puberulent within toward the acute tips which exceed the glabrous style.—A tree with red wood, the type in bud (Jelski). F.M. Neg. 4301.

Cajamarca: Tambillo, *Jelski 14*, type.

Styrax cordatus (R. & P.) A. DC. Prodr. 8: 267. 1844; 65. *Foveolaria cordata* R. & P. Syst. 1: 99. 1798. *Tremanthus cordata* (R. & P.) Pers. Syn. Pl. 1: 467. 1805. *Strigilia cordata* (R. & P.) DC. Prodr. 1: 621. 1824.

Subterete branches (these about 4 mm. thick), petioles (1.5 cm. long), and leaves beneath densely reddish lepidote, the scales peltate, those of the racemes and flowers similar but more or less yellowish; leaves ovate, rounded or minutely subcordate at base or the younger acute at base, subacutely acuminate, 11–13.5 cm. long, 6.5–7 cm. wide, more or less coriaceous, entire, the 11–13 lateral nerves obvious only beneath; racemes 4–7.5 cm. long, solitary or geminate, 3–7-flowered; bracts lanceolate, caducous; flowers about 14 mm. long, the subchartaceous truncate calyx 5 mm. high, 6 mm. across, obscurely denticulate, the scales within oblong and affixed laterally; corolla lobes valvate, 12 mm. long, lepidote stellate within as the filaments toward the base, exceeding the glabrous style, the ovary gray lepidote.—Perkins distinguished this from *S. ovatus* on the basis of its racemose flowers; apparently in all these specimens the flowers are racemose or paniculate on the same branch; however, in the type the midnerve axil flanges are united from one lateral nerve to the next while in *S. ovatus* they are distinct or nearly, but the character may be expected to vary. Compact shrub or tree. Illustrated, Ruíz & Pavón, Fl. Peruv. 4. *pl. 389.* F.M. Neg. 4304.

La Libertad: Valley of the Mixiollo, *Weberbauer 7037* (det. Killip, *S. Weberbaueri*). Prov. Pataz, *Weberbauer 7037* (det. Perkins, *S. Weberbaueri*).—Huánuco: Chinchao, Pillao and Pozuzo, *Ruíz & Pavón,* type. Huacachi near Muña, *4174* (det. Perkins, *S. Weberbaueri*). Lomas, *Raimondi.*

Styrax ferax Macbr. Field Mus. Bot. 8: 128. 1930.

A tree with slender subterete branchlets, the younger sordidly tomentose; petioles to 8 mm. long; leaves repand-undulate, rather ovate-oblong, subabruptly cuneate and sometimes more or less oblique at base, acute or shortly acuminate, 7–9 cm. long, 3–5 cm. wide, chartaceo-coriaceous, green, glabrous and slightly lustrous above, shortly tomentose beneath with gray and yellowish stellate trichomes intermixed; lateral veins 5 or 6, scarcely apparent above; racemes 4–6 cm. long, more or less panicled, terminal or axillary, yellowish stellate-tomentose; pedicels scarcely 1 cm. long; calyx minutely stellulate, denticulate, 4 mm. high; corolla 10–12 mm. long, 5-parted, sericeo-stellate without, the tube 1.5 mm. long, glabrous within, the lobes densely pilose at base.—Perhaps nearest *S. Poissonianus* Perk., a shrub typically with fewer leaf-nerves and larger flowers, or *S. tarapotensis* Perk., typically with simple racemes and much larger leaves. *S. loxensis* Perk. Pflanzenreich IV. 241: 41. 1907, has leaves 8–10.5 cm. long, 2.5–3 cm. wide, lateral nerves 8, racemes simple. *S. Pearcei* Perk. l.c. 46, of Bolivia, has about 9 lateral nerves, an almost hirsute-stellate indument, simple racemes. *S. Pentlandianus* Remy, 58, of Bolivia, is distinctive from all of these by the lepidote calyces; leaves with 7–8 nerves, simple 4–8-flowered racemes only 2–2.5 cm. long. Only more collections permitting fuller study will prove or disprove the validity of these characters, some of which may not be significant.

Junín: Chanchamayo Valley, *Schunke 431*, type; also *289; A39* (this referred to *S. Poissonianus* by Sleumer).

Styrax Foveolaria Perk. Pflanzenreich IV. 241: 85. 1907. *Foveolaria ferruginea* R. & P. Syst. 100. 1798, not *S. ferrugineus* Nees & Mart. *Strigilia racemosa* DC. Prodr. 1: 621. 1824, not *Styrax racemosus* (Cav.) A. DC. Prodr. 8: 265. 1844 (*Strigilia racemosa* Cav. Diss. 7: 358. *pl. 261*. 1789), fide Perkins. *Tremanthus ferruginea* (R. & P.) Pers. Syn. 1: 467. 1805.

Densely rusty stellate tomentose except the older subterete branches and the fleshy (or rigid in drying) coriaceous leaves, these lustrous above, entire, oblong or nearly, cuneate to rounded at base, acute or mucronulate, sometimes obtuse, 5.5–7.5 cm. long, 2–2.5 cm. wide, the 9–10 lateral nerves impressed above, these with the veins prominent beneath; racemes 4–6.5 cm. long, 9–14-flowered; bracts lanceolate, caducous; flowers about 6 mm. long on pedicels 1–2 mm. long; calyx obscurely denticulate, stellate within, corolla lobes valvate, 4 mm. long, the thickened tips fasciculate pubescent within; filaments marginally pilose, the anther margins stellate; ovary orange tomentose, early 3-celled with 1–2 ovules in each cell; fruit subovoid, 1 cm. long, half as thick, crowned by calyx and pilose style and with 1 or 2 erect oblong seeds.—The deeply multi-divided trichomes simulate fascicles of separate hairs. Unique in Peru on account of the few ovules, 16–24 being usual for the genus. A shrub or tree. With reluctance I have followed the monograph in the changed name which appears to me to be incorrect. Illustrated, Deless. Icon. Select. 5: *pl. 43;* Perk. l.c. 84, Ruíz & Pavón, Fl. Peruv. 4. *pl. 392* (as *F. ferruginea*).

Huánuco: In higher colder woods above Pillao, *Ruíz & Pavón*, type.

Styrax heteroclitus Macbr., sp. nov.

Arbor, 4 m. alta; ramulis 6 mm. crassis; petiolis 10–12 mm. longis, 3 mm. crassis, sordide stellato-furfuraceis; foliis late oblongo-ellipticis, basi late rotundato-cuneatis, bene acuminatis, ad 2.5 dm. longis, 11 cm. latis, rigide chartaceis, supra glabris, nervis (circa 9) impressis, venulis obscuris, subtus nervis venulisque conspicue reticulatis plus minusve dense hispidulo-stellulatis et satis obscure alutaceo-tomentulosis; racemis axillaribus vel ad nodos congestis, ad 8 cm. longis, intense ferrugineo-stellato-furfuraceo-tomentosis; pedicellis 1–1.5 cm. longis; calyce minutissime stellato-tomentoso, circa 6 mm. longo; corolla 15–17 mm. longa.—Apparently resembles most, in Peru at least, *S. oblongus* with thinner leaves and no stellate-hispid indument; ex char. it suggests *S. Sieberi* Perk. of Pará with much smaller flowers. Standley had referred the type to his *S. longifolius* (*S. Tessmannii*) and had given an herbarium name (after the collector) to *Klug 4282*, specimen imperfect, but pedicels shorter, hispid-stellulate indument on leaf-nerves sparser; feeling uncertain about the validity of this seemingly anomalous shrub I have not taken up this unpublished name.

San Martín: Juanjuí, *Klug 4282?*—Loreto: Balsapuerto, *Klug 3110*, type.

Styrax Mathewsii Perk. Repert. Nov. Sp. 2: 17. 1906; 68.

Allied to *S. peruvianus* from which apparently it is scarcely or doubtfully distinguishable; petioles 1.5–2 cm. long; leaves mostly oblong, finally glabrescent above, sometimes 10–12 cm. long, 4–5 cm. wide, the 12–13 lateral nerves prominent beneath; racemes 5.5–9.5 cm. long; flowers 17 mm. long; calyx 6 mm. long and broad; corolla lobes 12 mm. long, 2.5 mm. wide, reddish lepidote without, pilose within; filaments fasciculately barbate at base.—The Berlin specimen showed leaves only 8 cm. long, about half as wide. F.M. Neg. 4311.

Amazonas: Chachapoyas, *Mathews 2129*, type.

Styrax oblongus (R. & P.) A. DC. Prodr. 8: 261. 1844; 43. *Foveolaria oblonga* R. & P. Syst. 100: 1798. *Strigilia oblonga* (R. & P.) DC. Prodr. 1: 621. 1824. *Tremanthus oblonga* (R. & P.) Pers. Syn. 1: 467. 1805.

Branchlets 6 mm. thick, subterete and as all the growing parts except the leaves alutaceously lepidote stellate-tomentose; petioles 1.5 cm. long; leaves elliptic-oblong, rotund, somewhat obliquely acute or short, broadly but acutely acuminate, 22–26.5 cm. long, 9–11 cm. wide, entire, papyraceous, canescently and extremely finely tomentose beneath, glabrous above except for scattered trichomes on the 12–16 impressed nerves, these also scurfy stellulate and prominent beneath where closely reticulate with the veins; racemes or panicles 5.5–7 cm. long, the flowers about 17 mm. long on pedicels 5–10 mm. long; calyx chartaceous, to 9 mm. high, 6 mm. broad, subpilose within, the margin nearly truncate; corolla lobes valvate, thin, lanceolate, 1.5 cm. long, 4 mm. wide, stellate pilose within; filaments long pilose at base, the anthers marginally stellate; ovary tomentose, 3-celled, many-ovuled; style as long as the corolla lobes.—A tree 30 meters tall or taller with erect branches (Ruíz & Pavón). The more northern ranging *S. guianensis* A. DC. Prodr. (a later name) seems to be similar unless there is a constant difference in its yellowish indument. Here might be sought *S. bicolor* Ducke, Trop. Woods 90: 26. 1947, from São Paulo de Olivença, Brazil, "at first view distinguishable by the pretty red-brown under surface of the leaves" (Ducke). Illustrated, R. & P. Fl. Peruv. 4: *pl. 393*. F.M. Neg. 4313.

Huánuco: Pillao and Chinchao, in woods, *Ruíz & Pavón*, type.—Loreto: Pumayacu, Balsapuerto to Moyobamba, *Klug 3146* (det. Standley, *S. tarapotensis?*).

Styrax ovatus (R. & P.) A. DC. Prodr. 8: 267. 1844; 65. *Foveolaria ovata* R. & P. Syst. 100. 1798. *Tremanthus ovata* (R. & P.) Pers. Syn. 1: 467. 1805. *Strigilia ovata* (R. & P.) DC. Prodr. 1: 621. 1824.

Branches quadrate, 4 mm. thick; pubescence, except on the upper leaf surfaces where sparse, densely silvery yellowish lepidote, the scales minute and generally peltate except those within the calyx which are oblong and affixed laterally; petioles 1.5–2.5 cm. long; leaves ovate, rounded or more or less cuneate at base, shortly and broadly but acutely acuminate, 13–26 cm. long, 8–11 cm. wide, entire, papyraceous, the 12–13 lateral nerves and irregularly reticulate veins prominent only beneath; panicles (type) or racemes 7–8 cm. long, 8–19-flowered; flowers white, fragrant, 1.5 cm. long on basally bracted pedicels 6–15 mm. long; calyx chartaceous, 4 mm. high and broad, truncate, scarcely denticulate, the inner scales much branched; corolla lobes valvate, membranous, 11 mm. long, 3 mm. wide, pubescent within; filaments lepidote, the anther margins stellate; ovary lepidote, many-ovuled, the glabrous style shorter than the corolla lobes.—Apparently is conspecific with *S. cordatus.* Becoming a tall tree, the branches pendant (Ruíz & Pavón); 15 meters tall (Weberbauer). *S. Vidalianus* Sleumer, Notizbl. Bot. Gart. Berlin 13: 499. 1937, of western Colombia has leaves 12–16 cm. long, 5–7 cm. wide, the fruits 3 to even 4 cm. long, 1.5–2 cm. thick. Pubescence illustrated, Perkins, l.c. 4. *pl. 1;* Ruíz & Pavón, Fl. Peruv. 4: *pl. 390.* F.M. Neg. 4314.

Huánuco: Pozuzo, Chinchao and Pillao, *Ruíz & Pavón,* type. Vinuyaca, *Sawada 100.*—Cuzco: Valle de Santa Ana, Prov. Convençion, 1,300 meters in stream thicket, *Weberbauer 5208* (det. Perkins); 280. Bolivia?

Styrax Pavonii A. DC. Prodr. 8: 266. 1844; 28. *Strigilia Pavonii* (A. DC.) Miers, Contr. Bot. 1: 186. 1851.

Branchlets subterete, the younger as all the growing parts except the leaves densely yellowish-brown lepidote or lepidote-stellate-tomentose; petioles 1.5–2.5 cm. long; leaves broadly elliptic or sometimes ovate-oblong, rounded at base, shortly acuminate, acutish, entire or subentire, chartaceous, glabrous on both sides except the midnerve, the 10–12 lateral nerves and laxly reticulate veins prominent only beneath; racemes 7 cm. long; flowers about 2 cm. long; pedicels 1 cm. long; calyx 6 mm. high and broad, truncate, silky pilose within, corolla lobes valvate, papyraceous, 11 mm. long, 4 mm. wide, lanceolate, sparsely stellate pilose within; filaments long-pilose toward base, the anthers stellate marginally; ovary tomentose, many-ovuled; fruit obovoid, 2.5 cm. long, stellate pilose as the stout style. —*S. oblongus* in herbarium in part, from which it differs not only in the glabrous leaves but also in the nervature, as the tertiary nerves are smaller and the secondary less arcuate (DeCandolle). Strange that this hasn't been re-collected at one of these often-visited localities; perhaps it will prove to be a glabrous state of *S. ovatus* or *S. cordatus.* F.M. Neg. 4317.

Huánuco: Chinchao, Pozuzo, *Ruíz & Pavón,* type.

Styrax peruvianus Zahlbr. Ann. Naturh. Hofmus. Wien 7: 4. 1892; 67.

Branches and branchlets spreading, subterete, early densely covered with lustrous reddish peltate scales; petioles 8–12 mm. long; leaves ovate-oblong, rounded-cuneate or cuneate at base, acuminate and acutish, 7–8.5 cm. long, 3–3.5 cm. wide, green, lustrous, reticulate and soon glabrous above, densely reddish silvery lepidote beneath, the lateral nerves 8–10; racemes 4.5 cm. long; buds 7–8 mm. long on pedicels 1 cm. long; calyx 4–6 mm. high, 5 mm. broad, reddish lepidote, the scales within oblong or semiorbicular, affixed laterally; corolla lobes valvate, yellowish lepidote tomentose, glabrous within, apically penicillate, 8–9 mm. long, 2 mm. wide, acute, membranous; filaments densely barbate at base; ovary many-ovuled, silvery lepidote, the style glabrous.—F.M. Neg. 4318.

Cajamarca: Tambillo, *Jelski 16*, type.

Styrax Poissonianus Perk. Repert. Nov. Sp. 2: 18. 1906; 56.

Branchlets 4 mm. thick, subterete, the younger as all growing parts except the leaves above densely yellowish-gray stellate-tomentose; petioles 10–13 mm. long; leaves ovate-oblong or nearly oblong, cuneate or sometimes rounded-cuneate at base, abruptly and broadly but acutely acuminate, 10–13 cm. long, 4–5 cm. wide, entire, subcoriaceous, glabrous and lustrous above, the 8 or 9 lateral nerves prominent beneath, the veins laxly reticulate; inflorescence branched, the racemes 10–11 cm. long, about 8-flowered; flowers 17 mm. long on pedicels 1 cm. long or longer, bracteate medially; calyx 5 mm. high and broad, papyraceous, softly pilose within as also the valvate membranous corolla lobes, these acute, 14 mm. long, 3 mm. wide; filaments with fascicled trichomes near base, the anther margins stellulate; ovary yellowish stellate-pilose.—Possibly from Ecuador as to type, the Grisar collections having been made in either country without exact designation. *S. tomentosus* Humb. & Bonpl., 57, has much shorter simple racemes, at least as to type. Named after Jules Poisson, a French botanist.

Peru(?): Without data, (*Grisar*, type). Ecuador?

Styrax socialis Macbr. Candollea 5: 398. 1934.

Subscandent, the nearly terete somewhat tortuous branchlets glabrescent, the younger as the petioles densely brown-lepidote; leaves entire or obscurely undulate, ovate-oblong or subelliptic-oblong, rounded-acute at base, acuminate or subcaudate, about 15 cm. long, 5 or 6 cm. wide, chartaceous, hardly lustrous above where sparsely lepidote, especially the nerves, finally glabrate, beneath ashy pubescent, the 6 rather prominent nerves and reticulate veins densely lepidote, the intervening surface minutely stellate and lepidote; petioles 1 cm. long; racemes 4 cm. long, axillary, ascending, yellowish-brown lepidote, the pedicels 10–12 mm. long, the bracts obsolete;

calyx obscurely denticulate, 4 mm. high; corolla sericeo-lepidote without, 15 mm. long, 5-parted, the oblong-lanceolate lobes 3 mm. wide, pilose within only apically; anthers slightly pilose at base, 6 mm. long; style scarcely 12 mm. long.—Like *S. Tessmannii* Perk. (*S. guianensis*, sens. lat.) but much more lepidote and the flowers glabrous within except the tips; from *S. heterotrichus* Perk., of Ecuador, it differs in its long-acuminate (instead of short and broad) leaves and in the smaller trichomes, more numerous on the nerves.

Cuzco: In brushwood, almost climbing, 3 meters, Marcapata Valley, 1,500 meters, *Weberbauer 7819*, type.

Styrax tarapotensis Perk. Bot. Jahrb. 31: 479. 1901; 58.

Branches subterete, rusty tomentose; petioles 1 cm. long; leaves ovate-oblong or sometimes somewhat ovate-lanceolate, acute at base, acutely long-acuminate, 11–14 cm. long, 4–5 cm. wide, entire, papyraceous, glabrous above, densely clothed with whitish and rusty minute stellate trichomes beneath where the 6–7 lateral nerves are rather prominent, the veins narrowly reticulate; inflorescence racemose, often paniculate, the racemes 4–6-flowered; flowers 15 mm. long on pedicels 3–5 mm. long; calyx 5 mm. high, minutely and broadly denticulate, densely yellowish stellate-pilose without as also the valvate membranous corolla lobes, these lanceolate, 1 cm. long; filaments densely fasciculate pilose below, the minute anthers stellulate; ovary many-ovuled, yellowish tomentose, the style glabrous.—Mexia noted the name as meaning "bat food," the wood used for lumber, the tree attaining more than 25 meters. F.M. Neg. 4325.

San Martín: In mountains at the Río Mayo, Tarapoto, *Spruce 4827*, type.—Huánuco: Distrito Churubamba, above Río Cuyumba, 1,200 meters, *Mexia 8171* (det. Standley, *S. ovatus*).—Loreto: Florida, Río Putumayo, *Klug 1978*. Bolivia. "Chichicmicuna" (Mexia).

Styrax Tessmannii Perk. Notizbl. Bot. Gart. Berlin 10: 459. 1928. *S. longifolius* Standl. Field Mus. Bot. 22: 166. 1940.

Branches 3–6 mm. thick, the younger minutely pilose-tomentulose as the 1.5 cm. long petioles; leaves broadly oblong-elliptic or obovate-oblong, rounded or rounded-cuneate at base, more or less narrowly, sometimes shortly acuminate, 13–18 (26) cm. long, 5.5–9 (11) cm. wide, or somewhat larger, chartaceous, glabrous above, minutely and densely stellate-tomentose beneath, the 8 or more soon glabrous nerves and veins there prominent; racemes axillary or aggregate at the nodes, 4–10 cm. long, brown tomentose; flowers 15–17 mm.

long, on pedicels 5–7 mm. long or longer; calyx more or less denticulate, 6–8 mm. high, brownish tomentose and with some simple trichomes; corolla 1.5 cm. long, densely yellowish tomentose and within grayish stellate-pilose.—Near *S. macrotrichus* Perk. with smaller flowers and different pubescence (author) but apparently much nearer *S. guyanensis* and *S. oblongus;* it seems to me that *S. longifolius* has no tangible character. A tree with trunk about 2 dm. in diameter, the fruit, according to the collector, eaten by the natives, their name for the tree meaning "ash gray cacao." F.M. Neg. 4326.

Loreto: Cashito Plaza, Río Ucayali, *Tessmann 3272*, type. Río Mazán, *José Schunke 61* (type, *S. longifolius*). Non-inundated woods, Iquitos, *Ducke 1886* (distr. as *S. guyanensis*). Mishuyacu, *Klug 137; 428; 1057; 2535; Killip & Smith 29879.* Colombia. "Utxupa kakao."

Styrax Weberbaueri Perk. Repert. Nov. Sp. 2: 16. 1906; 64.

Resembles *S. ovatus* but the pubescence particularly of the many-flowered often paniculate inflorescences rusty instead of silvery lepidote and the coriaceous ovate leaves 10–14 cm. long, 4.5–5 cm. wide, glabrous, green and lustrous above, the lateral nerves about 14; inflorescence 5–11 cm. long, about 11-flowered, little-branched with bracts at the base of calyces; flowers 17 mm. long on pedicels 1 cm. long; calyx coriaceous, 6 mm. high, nearly as broad; filaments fasciculately pubescent toward base; ovary a little inferior; otherwise like the allied species.—Type from a shrub 5 meters high in mixed shrub-tree formation. This shrub probably is referable to *S. cordatus* which in turn is doubtfully more than a form or state of *S. ovatus.* The supposed differences in leaf-shape, texture and color of indument are probably individual variations; for example, in *S. Weberbaueri* the leaves are glabrous above and in the other species they are slightly pubescent, that is, as to types. Illustrated, Perkins, l.c. 64, *pl. 8.*

Amazonas: East of Chachapoyas, 2,000 meters, *Weberbauer 4367,* type; 262. Chachapoyas, *Mathews.*

OLEACEAE. Olive Family

Reference: Lingelsheim, Naturflanzenf. IV. 243. 1920.

Shrubs or trees with usually opposite leaves and mostly hermaphrodite flowers in small or ample panicles or sometimes fasciculate with more or less deeply 4 (9) -parted or 4 (9) -dentate campanulate calyx. Petals 4, narrow and free or joined into a hypocrateriform or infundibuliform corolla to which the 2 (–4) stamens are affixed. Ovary 2-celled, the ovules 2–10 in each cell. Fruit fleshy or capsular but coriaceous or ligneous, sometimes loculicidally dehiscent, the pendulous or erect seeds often alate.

Notable in horticulture as the source of the "lilac" (*Syringa* L.) so beloved in northern gardens, the oriental *Forsythia* Vahl and the widely grown Jasmine whose lovely, fragrant, usually white flowers have from time immemorial, following a Persian or near-east tradition, sweetened cakes for the marriage festival. The much appreciated Olive (*Olea europea* L.), native to the eastern Mediterranean region and western Asia, may persist in abandoned cultivated areas or is occasionally adventive, as at Chachapoyas (Williams) and at Tarma (Killip & Smith).

Leaves simple; flowers (Peru) 1–2; fruits dehiscent.....1. *Schrebera.*
Leaves various; flowers many; fruits indehiscent.
  Leaves simple; corolla lobed to base, or petals free, narrow. 2. *Linociera.*
  Leaves pinnate but often apparently simple by reduction; corolla tubular.................................3. *Jasminum.*

1. SCHREBERA Roxb.

Branches terete with simple (Peru) leaves and 1–2-flowered terminal panicles of usually, perhaps always, heterostylous-dimorphic flowers. Calyx cupulate or tubular-campanulate, irregularly divided or obscurely dentate. Corolla lobes 4–8, imbricate, spreading, shorter than the cylindric tube, obtuse or emarginate, densely barbate above. Ovules 3–4 in each cell. Capsule ligneous, pyriform.—Lingelsheim, l.c. 73, has discussed the presence of a single species in the New World; the genus is otherwise African and he regards it as a relic of much wider distribution; cf. also Gilg, Bot. Jahrb. 30: 70. 1901. It is closely related to the yellow-flowered, sometimes cultivated *Forsythia* Vahl of China and Japan and the popular *Syringa* L. of eastern Europe and Asia.

Schrebera americana (Zahlbr.) Gilg, Bot. Jahrb. 30: 71. 1901. *Nathusia americana* Zahlbr. Ann. Naturh. Hofmus. Wien 7: 4. 1892.

Glabrous, the branches yellowish-gray; petioles slender, 5–7 mm. long; leaves elliptic or ovate-oblong, gradually attenuate to the acute or rounded base, obtuse or emarginate, often mucronulate, 3–7 cm. long, 1.5–3 cm. wide, coriaceous, reticulate-veined, especially beneath, entire; peduncles 6–8 mm. long; calyx tubular-campanulate, truncate, 2–5-ciliate-denticulate, about 2 mm. long; corolla tube cylindric, 10–12 mm. long, the 4 ovate-deltoid irregularly incised lobes 5–7 mm. long; capsule obovoid-oblong, to 2 cm. long, 8 mm. thick, smooth, 4-sulcate.—Shrub to 8 meters tall, becoming leafless in the dry season, the falling leaves turning golden-yellow, the fragrant white flowers brown within at tip (Weberbauer).

Cajamarca: Callacate, *Jelski 363*, type. Cutervo to Guerocotillo, 1,500 meters, *Weberbauer 7169*. Frequent in rain-green shrub association, south of Pataz, 2,500 meters, *Weberbauer 7210*.

2. LINOCIERA Swartz

Mayepea Aublet, Pl. Guian. 1: 81. *pl. 31*. 1775.

Reference: Eichler in Mart. Fl. Bras. 6, pt. 1: 306–310. 1868.

Shrubs or trees with opposite entire leaves, the cymulose or umbellulate, sometimes fasciculate flowers disposed in more or less developed panicles or lateral fascicules. Petals 4, free or cohering at base, usually narrowly linear, induplicate-valvate, the small calyx 4-dentate or parted. Stamens 2 (rarely 4) affixed to base of petals; anthers sometimes with apiculate connective. Ovules 2 in each cell. Drupes with hard or crustaceous endocarp, usually with only 1 seed.—Besides the following, *Klug 698* from near Iquitos with obtuse leaves has not been identified; it resembles F.M. Neg. 20105, apparently an unpublished name, and preoccupied by *L. glomerata* Pohl; it may be referable to *L. elegans* Eichler, l.c. 306.

Linociera pubescens (HBK.) Eichler in Mart. Fl. Bras. 6, pt. 1: 308. 1868. *Chionanthus pubescens* HBK. Nov. Gen. & Sp. 3: 235. 1819.

Younger leaves and terminal subprecocious panicles more or less densely puberulent-tomentulose, the leaves soon glabrous or glabrate especially above; petioles 10–14 mm. long; leaves elliptic-oblong, obtuse at base, rounded or acutish at apex, reticulate-veined, to about 7 cm. long, 3–4 cm. wide; panicles 3-parted, sessile, corymbiform, opposite the branches, the flowers ternate, shortly pedicellate; bracts oblong, obtuse, villous as the 4-dentate calyx; corolla red, tube short, segments linear, 16–18 mm. long; anthers scarcely produced, 2 or 4; ovary glabrous, the 2 cells biovuled; drupe ovoid, striate, 1-seeded.—Possibly the Peruvian plant is separable from type but from material seen, scarcely so.

Piura: Valle del Quiros, 2,200 meters, *Weberbauer 6347*. Colombia.

3. JASMINUM L. Jasmine

Reference: Bailey, Man. Cultiv. Pls. 797–799. 1949.

Climbing or erect more or less woody plants with usually opposite imparipinnate leaves of 3–7 leaflets or these often reduced to one leaflet, the petiolule articulate, and salverform flowers borne in simple or branched terminal cymes. Calyx with 4–5 (–9) teeth. Corolla 4–5 (–9) -lobed or -parted, the lobes imbricated. Fruit a 2-lobed berry, each carpel 1–2-seeded.—The ancient Arabic name serves, happily, as the scientific.

Leaflets 3–7 . . . . *J. officinale.*
Leaves apparently simple.
  Corolla double . . . . *J. Sambac.*
  Corolla not double, the lobes often many . . . . *J. multiflorum.*

Jasminum multiflorum Andr. Bot. Rep. 8: *pl. 496*. 1807. *Nyctanthes multiflora* Burm. f. Fl. Ind. 5. *pl. 3, fig. 1*. 1768. *J. pubescens* Willd. Sp. Pl. 1: 37. 1797.

Puberulent evergreen liana with seemingly simple ovate leaves rounded or cordate at base, acute, and white flowers, about 2.5 cm. long; calyx teeth about 12 mm. long, finely pubescent, the corolla lobes at least as long as the tube.

Loreto: At Fundo Yca on Río Itaya, *Williams 211* (det. Standley). Yurimaguas, *Williams 4049* (det. Standley). Pio, on the Amazon, *Williams 2002*. India.

Jasminum officinale L. Sp. Pl. 7. 1753.

Deciduous glabrous shrub, the long weak finely grooved stems supported in other vegetation; leaflets 5–7, elliptic or ovate, acute or acuminate, the longer terminal one petiolulate; flowers white, fragrant, to 2.5 cm. long, laxly borne on slender pedicels; calyx teeth to a cm. long or longer; corolla lobes oblong, as long as tube.—The var. *grandiflorum* (L.) Bailey has showy flowers to 3.5 cm. across. Collected by Williams at various points, so apparently persisting or escaping from gardens.

Loreto: Yurimaguas, *Williams 4515* (det. Standley). Iran to China.

Jasminum Sambac (L.) Ait. Hort. Kew. ed. 1. 1: 8. 1789. *Nyctanthes Sambac* L. Sp. Pl. 6. 1753.

Scandent with angulate pubescent branches but nearly glabrous simple ovate nervose leaves, the short petioles abruptly erect-arcuate; flowers white, to 2.5 cm. across; calyx teeth marginally hirsute, about 6 mm. long; corolla lobes and tube subequal.—Many collections were made by Williams so apparently often cultivated or established; determinations by Standley, only a few cited.

Loreto: Caballo-Cocha, *Williams 2397.* Near Iquitos, *Williams 1506; 1546.* Yurimaguas, *Williams 4060; 4329.* Río Itaya, *Williams 3274.* India.

LOGANIACEAE. Logania Family

Character in general similar to Gentianaceae but stipules more or less clearly developed, at least as a stipular base, or plants definitely shrubs or trees.

Indument more or less glandular.
  Anther cells free, 2; calyx campanulate..............1. *Buddleia.*
  Anther cells peltate; calyx 5-parted..............2. *Peltanthera.*
Indument not at all glandular.
  Leaves coriaceous, somewhat spinescent lobate or *Ilex*-like. 3. *Desfontainea.*
  Leaves not at all spinescent.
    Fruit capsular; smooth herbs.
      Capsule with a cupulate base; style articulate....4. *Spigelia.*
      Capsule without a defined base; style inarticulate. 5. *Cynoctonum.*
    Fruit a berry; shrubs or lianas.
      Corolla lobes imbricate in bud; stipules merely lines. 6. *Strychnos.*
      Corolla lobes convolute in bud; stipules developed..7. *Potalia.*

1. BUDDLEIA L.

Usually trees or shrubs with interpetiolate stipules or the leaves joined by a stipular line and 4 (rarely 5) -merous flowers in variously arranged heads or cymes. Corolla often tubular, the lobes imbricate. Stamens in tube or throat short. Ovary 2-celled. Seeds many.—

Genus greatly in need of a revision, the following account limited accordingly. The name honors Adam Buddle, an English botanist.

Attractive Kisuar trees—often *B. incana* R. & P.—are sometimes still found in small groups in shrub formations at about 3,500 meters elevation; a fine photograph of several in characteristic habitat may be seen in Weberbauer (opp. p. 179). They were valued for building because of their strength and durability (Ruíz & Pavón); the Incas used the wood for incinerating their costly decorated idols in the fiesta of "R'aimi" and it is, in fact, an excellent firewood (Herrera). At Huancayo a cultivated species, perhaps *B. cestriifolia,* is known as "Taccora." *B. mollis* HBK., Nov. Gen. & Sp. 2: 349. 1818, was reported from Huaras, Ancash, (*Weberbauer 2991*) by Kränzlin (not seen); *Raimondi 176,* Chachapoyas, with in herb. his name by Melchior (F.M. Neg. 18172), once determined by me *B. americana* L., but leaves glabrate, thin, veins obscure, was not seen in preparation of this account. Lazella Schwarten, librarian of the Harvard Herbarium, kindly lent me a copy of Kränzlin's descriptions (Ann. Naturh. Hofmus. Wien 26: 395. 1912).

Leaves at least distinctly crenulate, often closely serrate or serrulate, rarely lobulate-dentate.
  Leaves irregularly lobulate-dentate. . . . . *B. chenopodiifolia.*
  Leaves not at all lobulate.
    Flower clusters many, rarely and then scarcely 1 cm. thick, usually only about 5 mm., sessile or subsessile.
      Leaves acute at base and decurrent on petioles.
        B. spicata, B. americana.
      Leaves subcordate at base. . . . . *B. betonicaefolia.*
    Flower clusters usually few, all or many thicker than 1 cm., more or less pedunculate.
      Peduncles of flower clusters mostly 1.5–2 cm. long.
        B. polycephala.
      Peduncles all or mostly much shorter.
        Leaves ovate- or oblong-lanceolate, long-acuminate, 3–5 times longer than wide.
          Leaves sessile, connate at base. . . . . *B. globosa.*
          Leaves petioled, decurrent at base. . . . . *B. incana.*
        Leaves oblong or oblong-elliptic, to 2 cm. wide.
          B. Blattaria.
Leaves entire or undulately and obscurely crenulate.

Inflorescence open with elongate spreading branches.
  Flower heads, at least the lower, pedunculate .... *B. diffusa.*
  Flower heads many, sessile .... *B. interrupta.*
Inflorescence closed, simple, or branches or peduncles if present short (species apparently mostly unstable).
  Leaves oblong-linear or -lanceolate, many times longer than wide.
    Flowers shortly pedicelled in small clusters ...... *B. montana.*
    Flowers sessile in heads 1 cm. thick or thicker.
      Leaves lustrous, conspicuously rugose above, mostly 3–5 cm. long, 5–10 mm. wide .... *B. ledifolia, B. vernixia.*
      Leaves opaque or little lustrous, smooth or lightly reticulate, mostly shorter or narrower.
        Heads more or less peduncled ... *B. ledifolia, B. coriacea.*
        Heads apparently sessile .... *B. pichinchensis.*
  Leaves somewhat obovate, 2–3 times longer than wide (all or some perhaps smaller forms of *B. coriacea,* sens. lat.).
    Leaves mostly or all longer than 1.5 cm.
      B. utilis, B. rhododendroides, B. ususch.
    Leaves mostly or all shorter than 1.5 cm. .... *B. buxifolia.*

Buddleia americana L. Sp. Pl. 112. 1753. *B. occidentalis* L. Sp. Pl. ed. 2. 162. 1762, as to Peru.

Tomentose-lanuginose shrub, except the veiny leaves, these glabrous above, revolute, broadly ovate-lanceolate, the stipules subreniform, interfoliate; racemes in terminal panicles composed of many very short spikes, bracts linear, the verticillate sessile flowers with 2 subulate bractlets beneath each tomentose calyx and corolla.—Fragrant flowers cream-colored. Illustrated, Ruíz & Pavón, Fl. Peruv. 1: *pl. 82, fig. b.* F.M. Neg. 26774 (as *B. longifolia*).

Piura: Negritos and Chicama, *Haught 176.*—Cajamarca: Huancabamba, *Bonpland.*—San Martín: Zepelacio, *Klug 3657.* Tarapoto, *Spruce 4117; Ule 6395.*—Lima: Chosica, *Soukup 2120.* Near Lima, *André 4112; Ruíz & Pavón; Isern.* Along Río Rimac, *Ruíz & Pavón* (as *B. occidentalis*). Huertas, *1343.* Matucana, *292.* Río Chillón, *Pennell 14493.*—Huánuco: Muña, *Ruíz & Pavón.* Huánuco, *2311* (det. Killip). Yanano, *3782* (det. Killip).—Cuzco: Valle de Urubamba, *Herrera 3231* (det. Standley). Valle de Santa Ana, *Herrera 3611.* Anta, *Vargas 121.* "Carpales" (Ruíz & Pavón); "lengua de vaca" (Vargas).

Buddleia betonicaefolia Lam. Ill. 1: 291. 1791.

Upper stems, leaves beneath and panicles puberulent-lanate; petioles in type about 2 cm. long; leaves ovate-oblong, obtuse, clearly crenulate, glabrate or glabrous and very rugose above, about 1 cm. long or longer, half as wide; spikes interrupted, paniculate, the few-flowered glomerules (about 5 mm. wide) all sessile; calyx about 4 or 5 mm. long.—Kränzlin (Ann. Naturh. Hofmus. Wien 26: 397. 1912) referred here with little doubt *Jameson 148* from Quito, describing it as follows: branch obscurely tetragonous, densely pale ferrugineous-pilose; internodes to 3 cm. long; leaves short-petioled, ovate-oblong, subobtuse, crenate, bullate above, opaque beneath, paler, sparsely pilose, brown-reticulate, 5.5–6 cm. long, 2.5–2.8 cm. wide; inflorescence paniculate, the many branches about 5 cm. long; flowers few, in dense glomerules, scarcely 2 mm. long; calyx lobes acute, shortly triangular, the scarcely longer corolla with rounded lobes. Perhaps the short petioles and very small flowers make Kränzlin's suppositions incorrect. F.M. Neg. 38092.

Peru: *Jos. Jussieu*, type, without data. Ecuador? "Bulege."

Buddleia Blattaria Macbr. Candollea 5: 399. 1934.

Inordinately fulvous lanate, the quadrate branchlets finally glabrate; leaves sessile, more or less distinctly undulate-crenate, fleshy-coriaceous, oblong or oblong-elliptic, acutish or obtuse, about 5 cm. long, 1–1.5 (2) cm. wide, glomerules single, terminal, globose, 2 cm. in diameter, sessile or shortly peduncled; calyx turbinate-campanulate, 6.5–7 mm. long, fuscous pilose, especially above, the short teeth strongly thickened; corolla little exserted, lobes 4 or 5, broadly oblong, truncate, about 5 mm. broad, pilose only above and in the throat; filaments nearly obsolete; style 2 mm. long, stigma broadly capitellate, ovary densely pilose; capsule finally glabrate, 6 mm. long. —Type to 1 meter tall.

Piura: West of Huancabamba, 3,200 meters, *Weberbauer 6046*, type.

Buddleia buxifolia Kränzlin, Bot. Jahrb. 50: Beibl. 111: 40. 1913.

Squarrosely much-branched tree, the type 8 meters tall, the closely leafy branchlets more or less tortuous, 1–1.5 dm. long, with fragile black bark; leaves sessile or subsessile, slightly revolute, oblong, acutish, 12–17 mm. long, 5 mm. wide, glabrous, lustrous and minutely rugulose above, obscurely reddish pilose beneath; inflorescences terminal, the 5–8 globose heads of sessile flowers pedunculate, 12–15 mm. in diameter, the reddish pilose rachis quadrate; calyx short-campanulate or obconic, barely 4 mm. long, the rather large teeth acute, the little longer corolla more than 4.5 mm. broad, the anthers sessile in the throat; style shorter than ovary, stigma clavate. —Striking in the position of the small flowers at the branchlet tips.

Ayacucho: Hacienda Tortorabamba, southwest of Ayacucho, 3,500 meters, *Weberbauer 5467,* type.

Buddleia chenopodiifolia Kränzlin, Bot. Jahrb. 50: Beibl. 111: 35. 1913.

Branches many, terete, the brown bark fragile, the older sparsely, the younger densely yellowish-white pilose-lanate as the leaves beneath; internodes 5–7 cm. long, petioles to 1 cm. long; leaves cuneate-ovate, the base somewhat biauriculate, obtusely acute at apex, coarsely and remotely few-dentate-lobulate, glabrous and impressed-reticulate above, to 8 cm. long, 3–3.5 cm. wide, the sessile uppermost much smaller; spikes to 2 dm. long, the dense many-flowered glomerules scattered below, the upper coalescent in a head, bracted; calyx tomentose, short triangular teeth obtuse; corolla scarcely 3 mm. in diameter, little exserted, white, lobes rounded.—Leaves simulate those of many species of *Atriplex* or *Chenopodium.*

Ayacucho: Rocky outcrops in mixed formation, 3,000 meters, *Weberbauer 5519,* type.—Apurímac: Rainy-green shrub-land, Río Chincheros, *Stork & Horton 10785.*

Buddleia coriacea Remy, Ann. Sci. Nat. sér. 3. 8: 226. 1847.

Trunk sometimes several dm. across, often irregular, crown dense, the branches terete or early subtetragonous; petioles 3–5 mm. long; leaves about oblong or sublanceolate, often 3–6 or 10 cm. long, about 6–14 mm. wide, entire, coriaceous, glabrous above, canescent beneath (as young petioles and inflorescence) with a dense velvety tomentum; glomerules 1–1.5 cm. wide, compact, shortly peduncled in an oblong-pyramidal inflorescence 5–8 or 15–20 cm. long, corymbose in fruit; bracts linear, exceeding short pedicels; calyx angled, 4–5-denticulate; corolla golden-orange, fragrant; capsules tomentose, exserted.—After Weddell but probably should be drawn to include the following specimens and probably other proposed species. Flowers orange-yellow changing to orange-red; planted near fields (Weberbauer); as an ornamental in plaza of Juliaca but native (Hodge). F.M. Neg. 38929.

Huancavelica: Near Huancavelica, *Stork & Horton 10814.* Canchis, *Vargas 9842.*—Cuzco: *Gay.* Paucartambo, *Herrera 297.*—Puno:

Juliaca, *Hodge 6258*. Near Puno, *Soukup 366; 367; Weberbauer 470*. Limbani, *Vargas 9661*. Lake Titicaca, *Weddell; Meyer*.—Moquequa: Saylafen, *Weberbauer 7335*. Bolivia. "Colli" (Herrera); "culli" (Hodge); "puna-quishuar" (Herrera); "orcco-quishuar."

Buddleia diffusa R. & P. Fl. Peruv. 1: 53, *pl. 80, fig. a.* 1798.

Tomentose-lanuginose shrub with subscandent much-branched diffuse branches and ovate-subcordate acute entire or subentire leaves, these pubescent above, decurrent on the short petiole; stipules persisting, subreniform, interfoliate; panicles axillary and terminal, the linear-bracteolate sessile flowers in small binate heads or three-terminal; yellow corolla, throat villous.—My *1350* trailing from cliffs or supported in other shrubs, 3 meters, flowers cream-colored. F.M. Neg. 26771.

Huánuco: Edge of fields, *Ruíz & Pavón*, type. Ambo, *1350* (det. Killip). Yanano, *3806* (det. Killip).—Apurímac: Abancay, *Vargas 1464*.—Cuzco: San Miguel, *Vargas 2150*. Urubamba, *Weberbauer 5054* (det. Kränzlin). "Quisoar."

Buddleia interrupta HBK. Nov. Gen. & Sp. 2: 348. 1818. *B. pilulifera* Kränzlin, Bot. Jahrb. 40: 309. 1908. *B. Szyszylowiczii* Zahlbr. Ann. Naturh. Hofmus. Wien 7: 6. 1892.

A densely branched meter high bush, the bark of the branchlets and the under leaf-surfaces yellowish-tomentose, the leaves closely pilose above, their petioles a cm. long; leaves oblong-lanceolate, in type acuminate at both ends, entire, smooth or nearly above, the nerves little prominent beneath, 6–10 cm. long, 15–22 mm. wide; glomerules a few mm. in diameter at intervals of 6–7 mm. in squarrose panicles, pedicels fulvous lanate; calyx segments oblong-rounded, setose-tomentose, the scarcely longer corolla glabrous; ovary glabrous above.—Flowers yellowish-white, scarcely 2 mm. long; inflorescence of *B. occidentalis* but flowers smaller (Kränzlin, Ann. Naturh. Hofmus. Wien 26: 398. 1912, wrote: *B. pilulifera* is very similar to *B. Szyszylowiczii* but the latter has leaves subobtuse at base, inflorescence not so narrowed, calyx lobes more ovate with rounded instead of narrow sinus); it seems probable that these are variations to be expected in one species, apparently first described by HBK. F.M. Negs. 3887; 3905 (*B. pilulifera*); 31944 (*B. Szyszylowiczii*).

Cajamarca: Mixed formations below Santa Cruz, *Weberbauer 4124* (type, *B. pilulifera*). Cutervo, *Jelskii 34* (type, *B. Szyszylowiczii*). Callacate, *Raimondi*. Without locality, *Bonpland*, type.

Buddleia globosa Hope, Verh. Holl. Maatsch. Harlem 20, pt. 2: 417, *pl. 11*. 1782. *B. globosa* Lam. Ill. 1: 291, *pl. 69*. 1791. *B. connata* R. & P. Fl. Peruv. 1: 52, *pl. 81, fig. b*. 1798.

Shrub with many terete little-branched stems, the branches hexagonal, fragile, tomentose as the basally connate lanceolate leaves beneath; stipules reniform; leaves acute, distinctly crenulate or serrate, rugose-venose, asperous to glabrate above; peduncles solitary, axillary and terminal, often binate; bracts below the sessile capitate flowers opposite, linear-subulate bractlets binate, free; calyces and capsules tomentose; corolla yellow-orange, throat villous.—Curious that this species apparently has not been re-collected or recognized; long known in cultivation. Illustrated, Bot. Mag. 55: *pl. 2853*. F.M. Neg. 29456.

Lima: Prov. of Chancay, *Ruíz & Pavón* (type, *B. connata*).

Buddleia incana R. & P. Fl. Peruv. 1: 52, *pl. 80, fig. b*. 1798. *B. bullata* HBK. Nov. Gen. & Sp. 2: 348. 1818. *B. rugosa* HBK. l.c. 347. *B. longifolia* HBK. l.c. 349.

Type a small erect rather stout tree with leafy much-branched crown, the stout or slender obtusely tetragonous branchlets as the oblong lanceolate crenulate leaves beneath white tomentose-lanuginose; petioles 3–15 mm. long; stipules semicircular, interfoliate; leaves glabrous, rugose and dark green above, often 1–1.5 dm. long, 2.5–4 cm. wide; racemes subpaniculate, ternately divided, the linear bracts acute; flowers sessile, in globose pedunculate heads about 1 cm. across in flower, the subulate free bractlets as the calyces tomentulose.—Leaves only 5 cm. long, 1.5 cm. wide in my *953* and in Pennell specimen, mine with large sprawling trunks. A tree or treelike bush of 5 to 7 meters, the trunk 1 dm. thick, the yellow flowers ageing orange, finally orange-brown, the pedicels quite tomentulose (Woytkowski); corollas orange, ageing reddish (Pennell); the hard wood is very useful for various utensils (Ruíz & Pavón). Illustrated, HBK. l.c. *pl. 186* (*B. longifolia*). F.M. Negs. 38914 (*B. bullata*); 3906 (*B. rugosa*); 26772; 38915; 26774 (Mathews).

Ancash: Conín, *Weberbauer 2908* (det. Kränzlin).—Lima: Prov. Canta, Huaracheri, Tarma and Huánuco, along railroad toward La Oroya, *Weberbauer 212; Ruíz & Pavón*, type.—Huánuco: Pillao, *Woytkowski 34120* (det. Cuatrecasas). Northeast of Huánuco, *2200*. Sunny grassy river banks, Chasqui, *1771* (det. Killip).—Junín: Huasahuasi and Acobamba, *Woytkowski 43*. La Oroya, limestone river cliffs, *953* (det. Killip). Near Cerro de Pasco, *Kanehira 6*. Tarma, *Killip & Smith 21892.* Huancayo, Ahuac, *Soukup 2944.*—Cuzco: San Sebastian, *Pennell 13599.* Cerro de Cusilluyoc, *Pennell 13909* (both det. Standley). Near Cuzco, *Herrera 775; 306; 1517* (leaves size of type).—Puno: Limbani, *Vargas 1304* (leaves small, det. Standley). "Quisuar" or "quisoar" (Ruíz & Pavón); "alamo" (Herrera).

Buddleia ledifolia Kränzlin, Bot. Jahrb. 50: Beibl. 111: 42. 1913.

Small much-branched shrub, the short densely leafy branchlets ferrugineous-tomentose as the leaves beneath, 8–10 cm. long; leaves linear-lanceolate or linear, coriaceous, convex, to 3 cm. long, scarcely 5 mm. wide, glabrous and lustrous above, the midnerve strongly marked beneath; flowers few, in solitary or two shortly peduncled linear bracted heads at branchlet tips; calyx not more than 3 mm. long, villous without, the corolla little longer, pilose only without, campanulate, the lobes rounded, the anthers sessile in the throat; ovary subtetragonous with short style and rather long stigma nearly equaling the corolla tube.—Perhaps in the neighborhood of *B. pichinchensis* HBK. (author).

Peru(?): Mountains around Lake Titicaca, (*Herzog 2511*). Bolivia; Ecuador.

Buddleia montana Britton, Bull. Torrey Club 25: 544. 1898.

Squarrose shrub sometimes 2 meters tall with fragile blackish bark, the densely leafy scarcely tetragonous branches often tortuous; petioles 5 mm. long; leaves entire, lanceolate, acute at base, acuminate, to 6.5 cm. long, 1.5 cm. wide, glabrous above, ferrugineous-tomentose beneath; panicles little longer than leaves, the ultimate racemes laxly globose, the manifestly peduncled calyces densely villous; flowers 4- or 5-merous; calyx campanulate, 5 mm. long, teeth short; corolla campanulate, 7 mm. long, the spreading lobes orbicular, the tube pilose within and without, the sessile anthers inserted medially; ovary subglobose, pilose, style short as clavate stigma, scarcely attaining corolla throat.—After Kränzlin, who found the flowers 5-merous, the anthers not exserted. Cf. *B. coriacea, B. abbreviata.*

Ayacucho: Above Osno to Río Apurímac, 3,400 meters, *Weberbauer 5567* (det. Kränzlin). Bolivia.

Buddleia pichinchensis HBK. Nov. Gen. & Sp. 2: 347. 1818.

Type with glabrous terete branches, the tetragonous branchlets as leaves beneath and simple sessile panicles ferrugineous-tomentose;

petioles scarcely 2 mm. long; leaves lanceolate, acuminate, crenate, 5 cm. long or longer, reticulate-venose and glabrous above; heads globose, about 1 cm. in diameter on peduncles to 2.5 cm. long, bracts linear; flowers sessile; calyx campanulate, 4-parted, pilose tomentose without, little shorter than the campanulate corolla, the segments reflexed, style included.—After HBK. and probably should be drawn to include *B. ledifolia* and *B. coriacea.* F.M. Neg. 3902.

Peru (probably). Ecuador.

Buddleia polycephala HBK. Nov. Gen. & Sp. 2: 346. 1818. *B. lanata* Benth. var. *peruviana* Macbr. Candollea 5: 400. 1934.

Lax, the tetragonous branchlets, leaves beneath and panicles ferrugineous-tomentose; leaves ovate, lyrate and in type connate at base, subcrenate, more or less ferrugineous-pubescent above, to 1.5 dm. long; heads globose in terminal panicles, on peduncles 1 cm. long or longer; calyx campanulate, 4-parted, tomentose, nearly as long as corolla, this tomentose toward apex without and within; ovary apically tomentose.—F.M. Neg. 3903.

Piura: Below Ayavaca, *Bonpland,* type; *Weberbauer 6360* (type, *B. lanata,* var.). Ecuador.

Buddleia rhododendroides Kränzlin, Ann. Nat. Hofmus. Wien 26: 395. 1912.

Stoutly branched, the older bark fragile, the newer as the leaves beneath densely ferrugineous-tomentose; leaves sessile, obovate-lanceolate, acute, midnerve prominent beneath, glabrous above, 3 to nearly 4 cm. long or longer, usually 7–8 mm. wide; flower heads about 10 in a simple raceme, the lower long- the upper short-pedunculate or sessile, nearly 2 cm. in diameter, densely ferrugineous-villous, the calyces with acute teeth 4 mm. long; corollas 6 mm. long, 5 mm. across at top, obconic, villous without except the broad glabrous lobes; anthers sessile in throat, the style not reaching this; flowers drying a dark steel blue color.—After Kränzlin, who remarks: the flower heads recall from a distance those of *B. globosa* Hope; type by Lobb (not seen) without data unless "Bolivia," which may be an error. *Weberbauer 5832* from Coracora, Ayacucho, referred here in Herbarium Dahlem, has the small leaves of *B. buxifolia,* which suggests (if the Weberbauer specimen was correctly determined) that the species may be as that, a part of *B. coriacea,* the leaf-size probably due to local conditions.

Peru(?): Compare with above.

Buddleia spicata R. & P. Fl. Peruv. 1: 53, *pl. 81, fig. a.* 1798.

Tall lanuginose shrub with ovate acutely acuminate serrate leaves and a long spike of many glomerulate sessile subulate bracted flowers; stipules none or caducous and interfoliate; corolla tomentose without, throat hirsute.—After Ruíz and Pavón; perhaps a part of *B. americana,* if not the same.

Huánuco: Common about Muña, *Ruíz & Pavón,* type.—Junín: Huacapistana, *Weberbauer 2034* (det. Kränzlin).

Buddleia ususch Kränzlin, Bot. Jahrb. 40: 308. 1908.

Type to 4 meters high, much branched, bark of younger branchlets fragile, black, short-pilose; petioles 2 mm. long; leaves many, obovate, acute, 1.5–2 cm. long, 7–8 mm. wide, reddish short-pilose beneath, glabrous or sparsely pustulate above; glomerules of flowers in dichasial panicle, 1.5 cm. in diameter, dark pilose; calyx tubular, finally obtusely 4-dentate, densely villous, little exceeded by the corolla, this glabrous except for exserted portion, the orbicular segments subequal; anthers large, sessile; flowers 2.5 mm. long, at throat as broad, yellow turning orange, red and finally brown.—In the dry season the entire foliage is black, this color shining beneath the red indument of the under side of the leaves; flowers said to lack the fragrance of saffron noted for the similar *B. utilis.* F.M. Neg. 3911.

Ancash: In brooks, Tallenga to Piscapacha, 3,700 meters, *Weberbauer 2880,* type. "Ususch."

Buddleia utilis Kränzlin, Bot. Jahrb. 50: Beibl. 111: 36. 1913.

Similar to *B. ususch;* leaves oblong, cuneately narrowed to base, obtuse, often reflexing, entire, to 2.5 cm. long, 1 cm. wide, reddish-tomentose beneath, glandular-pilose above; peduncles and linear bracts glandular as the campanulate 4 mm. long calyx; corolla about 5 mm. long and broad.—Uppermost leaves scarcely 1 cm. long, 2.5 mm. wide; the flowers have the fragrance of saffron; inflorescences crowded. Type, 8 meters tall.

Blossoms sold in Lima markets as a substitute for saffron (Weberbauer).

Huancavelica: Acobamba, Prov. Angaraes, 3,800 meters, *Weberbauer 5675,* type. Recuay, *Raimondi.* "Kisuar," "safran," "azafrán."

Buddleia vernixia Kränzlin, Ann. Nat. Hofm. Wien 26: 394. 1912.

Young branches densely ferrugineous-villous; petioles 1.5 cm. long; leaves lanceolate, acute, about 2 dm. long, 4–5 cm. wide, lustrous, glabrous and lightly reticulate above, densely reddish tomentose beneath where midnerve prominent, lateral nerves about 20; panicles more or less hidden in the leaves, the 3-verticillate branches widely spreading, the branchlets also ternate, the primary peduncles 5 cm. long, all reddish tomentose and bractless; floral bracts linear; heads many-flowered, globose; calyx obconic, acutely parted nearly medially; corolla (before anthesis) 4 mm. long, about twice as long as calyx, pilose without, glabrous within or with a few scattered trichomes; anthers visible in the sinuses of the suborbicular lobes.—After author, who wrote: no doubt near *B. longifolia* HBK. Nov. Gen. & Sp. 2: 349, *pl. 186.* 1818, but leaves quite glabrous above; type, herb. Wien (only a scrap), purporting to be from Quito by Spruce. F.M. Neg. 3913.

Huánuco: East of Huánuco, *Weberbauer 2628,* type; *2200* (det. Killip, *B. incana*).—Junín: La Oroya, *953* (det. Killip, *B. incana*); *Raimondi* (as *B. coriacea,* herb. Dahlem).—Cuzco: Urubamba, *Weberbauer 4922.*—Puno: Near Puno, *Vargas 496* (det. Standley, *B. globosa*). Ecuador? Bolivia?

2. PELTANTHERA Benth.

Smooth trees with membranous leaves, the margins slightly or obscurely glandular-serrate, the surfaces soon smooth; stipules undeveloped. Inflorescence terminal, pyramidal, the small flowers 5-merous. Calyx lobes linear, minute, free. Corolla tubular, the short lobes lanceolate, the short stamens at their base, the anthers 1-celled. Ovary 2-celled; style slender, stigma peltate.

Peltanthera floribunda Benth. in Benth. & Hook. Gen. Pl. 2: 797. 1876.

Single species with oblong-elliptic leaves about 2 dm. long, half as wide or larger, and innumerable almost minute fragrant white flowers in cymes disposed in a compound panicle.—Illustrated, Pflanzenfam. 4, Abt. 2: 44, *fig. 25* (flower). F.M. Neg. 3872.

San Martín: Tarapoto, *Spruce 4940,* type.

3. DESFONTAINEA R. & P.

Closely or intricately branched shrubs with lustrous hard leaves usually spinescent or at least with abruptly apiculate remote teeth or shallow lobes and apical bibracteolate 5-merous red or yellow flowers. Corolla tubular, lobes convolute, the short stamens inserted between them. Disk none. Ovary 5-celled, ovules numerous, style slender, elongate, stigma capitate.—Ruíz and Pavón must have pleased their contemporary botanist Desfontaine in using his name for this beautiful shrub.

Desfontainea obovata Kränzlin, Bot. Jahrb. 40: 312. 1908.

Branches gray, not squarrose; leaves opposite, cuneate-obovate, rounded or retuse, few- and short-dentate or subentire, the teeth subulately apiculate, lustrous and deeply exarate above, middle nerve prominent beneath, the nerves sparsely pilose, margin revolute, 3–5 cm. long, 1.5–2.5 cm. wide, flowers solitary at branchlet tips; calyx divided to base, the linear segments 4 mm. long, sparsely pilose or fimbriate, the much longer corolla shortly infundibuliform above, the oblong-rounded lobes densely fimbriate, red, the lobes yellowish, 3 cm. long, tube 3–4 mm. wide, the limb scarcely 1 cm.—Distinct by its leaves; flowers as large as those of *D. parvifolia* Don, smaller than those of *D. spinosa* R. & P. and *D. splendens* HBK. (author).

Puno: Chunchusmayo, Sandía, (*Weberbauer 1079*, type).

Desfontainea spinosa R. & P. Fl. Peruv. 2: 47, *pl. 186*. 1799.

Sometimes 3 meters tall, the *Ilex*-like leaves oblong-ovate to subrotund or obovate, usually with 3 or several apiculate or spinescent teeth or shallow lobes, often to 4 cm. long, half as wide, or larger or smaller; stems with enlarged nodes, thickened stipular lines; petioles to about 5 mm. long, the leaf-base more or less cuneate; pedicels 5–8 mm. long; calyx lobes ovate to oblong, obtuse to acuminate, 3–6 mm. long, often ciliolate; corolla 2.5–3 cm. long, scarlet or reddish-yellow or orange, the lobes many times shorter than the narrow tube.—Well developed, this is an attractive shrub usually on mossy rocky outcrops. Var. *parvifolia* (Don) Hook. has leaves about 1.5 cm. long, 1 cm. wide.

Cajamarca: Cutervo, *Raimondi*. Near Socota, *Stork & Horton 10139*.—San Martín: Ventilla, *Raimondi*.—Huánuco: Muña to Pozuzo, *Ruíz & Pavón*. Sariapampa, *Woytkowski 34299*. Palca, *Weberbauer 2478*. Dense canyon jungle, near Huánuco, *2197* (var., det. Killip). Compact shrub, Tambo de Vaca, *4452* (det. Killip).—Junín: Near Tarma, *Ruíz & Pavón*, type. Huacapistana, *Weberbauer 2099*.—Huancavelica: Surcubamba, in shrub wood, *Stork &*

Horton 10353.—Cuzco: Tres Cruces, Paucartambo, *Vargas 2107.*—Puno: Near Puno, *Weberbauer 1079.*

4. SPIGELIA L.

Herbs often flowering as annuals with pinnate or 3–5-nerved leaves with single or forked slender spiciform inflorescences. Calyx glandular punctate within, 5-parted, the segments narrow. Corolla more or less tubular, the lobes valvate in bud, the 5 stamens often in the usually somewhat broadened upper part. Ovary 2-celled, style slender, pubescent above, articulate near or below middle. Capsule twin, 2-celled, few-seeded, at maturity separating from persisting base, 2–4-valvate.—Adrian Spiegel, early in the seventeenth century, may have given the first instructions in the preparation of an herbarium. My indebtedness to Joseph Ewan for his elucidating account of Colombian species, Caldasia 4: 293–303. 1947, is gratefully acknowledged.

Flowers 2 cm. long or longer.................... *S. pedunculata.*
Flowers much shorter.
  Corolla pink or white; leaves quite glabrous............ *S. Gilgii.*
  Corolla white or straw-colored; leaves puberulent on nerves.
    S. anthelmia.

Spigelia anthelmia L. Sp. Pl. 149. 1753; ed. 2. 213. 1762. *S. nervosa* Steud. in Flora 26: 764. 1843.

Slender, to several dm. tall from a cluster of shallow roots, usually single or with few nearly leafless branches floriferous at tips, all rather succulent, weak; leaves reduced and early deciduous below, the two uppermost pairs so approximate as to appear verticillate, subtending the inflorescence, broadly rhomboid-ovate to narrowly lanceolate, acuminate, membranous, scabrellous above, glabrous beneath except for a few crisp-hyaline trichomes on the veins toward subsessile base; spikes usually 3, single or branched, erect or ascending, usually rather uniformly 15–30-flowered from base; flowers early marcescent, calyx lobes subequal, lance-acuminate, narrowly hyaline-margined, 2 mm. long; corolla pale straw-colored, purplish toward tip, 5–8 mm. long, the short triangular lobes soon reflexing; stamens included; capsule usually finely echinate above base, the cocci 3–4 mm. long; seeds ovoid, rounded dorsally, tessellate, chestnut-brown, to 1 mm. long. —After Ewan; the var. *peruviana* DC. Prodr. 9: 7 has the calyx lobes lightly pubescent. If a Bentham plant with smooth cocci is specifically distinct it probably belongs with all the following specimens, to which Standley referred several.

San Martín: Tarapoto, *Ule 6565; Williams 6054; 6745.* San Roque, *Williams 7806.* Juanjuí, *Klug 3889.*—Huánuco: Huancabamba and Pozuzo fields, *Ruíz & Pavón.*—Loreto: Iquitos, *Williams 7936.* Widely distributed. "Pega-pinto" (Williams).

Spigelia Gilgii Macbr. Candollea 6: 18. 1934. *S. nervosa* Gilg, Bot. Jahrb. 25: 722. 1898, not Steudel, 1843.

Stout annual or tall short-lived perennial with a cluster of woody-fibrous shallow roots, the subquadrangular stems strongly pubescent above; leaves persisting, ovate-lanceolate, acute or acuminate, narrowed to the short (3–5 mm. long) petioles, usually 8–15 mm. long, 2.5–4.5 (6) mm. wide, glabrous; spikes 3 or 4, 1–2 dm. long, secund, laxly 20–30-flowered for nearly their entire length; calyx lobes subulate, 3–4 mm. long, erect or recurved at tips, glabrous; corolla pink or lilac, the deltoid lobes erect; stamens included; capsules muricate, the ovoid cocci 4–4.5 mm. long; seeds ovate, rounded dorsally, muricate, dark coffee-brown, 2 mm. long.—After Ewan, as determinations.

Loreto: Soledad, Río Itaya, *Killip & Smith 29600.* Río Mazán, *José Schunke 308.* Ecuador.

Spigelia pedunculata HBK. Nov. Gen. & Sp. 3: 185. 1819.

Stout foliose herb from several robust but shallow roots, the usually quadrangular hollow but ligneous stems now simple now freely branching chiefly above, sometimes a meter tall or taller; petioles 4–7 mm. long, the prominent interpetiolar membrane broadly triangular, ciliolate; leaves ovate and acute or lanceolate and acuminate, 8–14 cm. long, the upper 5–6 cm. wide, subcoriaceous, strongly nerved, glabrous or occasionally finely crisped pubescent on the margins; spikes solitary and terminal or less often 2 or 3 or axillary, strictly secund, ascending, usually closely 10–18-flowered one-third to one-half their length; calyx lobes lance-acuminate, subequal, puberulent and ciliate, 6–7 mm. long, stiffly spreading in fruit; corolla livid rose-violet or pink, (2) 2.5–3.5 mm. long, the ovate acute lobes cuspidate; stamens barely exserted; capsule finely echinate at apex, glabrous below, the cocci 7 or 8 mm. long; seeds ovoid or trigonous, scrobiculate, dull dark brown, 4 mm. long (after Ewan).—The similar *S. Humboldtiana* C. & S. of Venezuela and Colombia has well-exserted stamens, strongly recurved fruiting spikes, smooth capsules. The Peruvian specimens have not been seen in the preparation of this account but are said to have the large flowers of this species and may be referable to *S. Humboldtiana.*

In adjacent Colombia the species is said to be highly poisonous (Ewan).

Loreto: Mouth of Río Santiago, (*Mexia 6290,* det. Standley, *S. leiocarpa*). Yarina Cocha, (*Tessmann 5481*). Ecuador; Colombia. "Kanena" (Tessmann).

5. CYNOCTONUM J. F. Gmelin

Annual herb with small secund 5-merous flowers in forked spikes. Stamens inserted at base of corolla tube. Ovary not quite free, the short or obscure style with capitate stigma. Capsule twin, 2-celled, laterally flattened, finally separating into few–several carpels which open loculicidally.

Cynoctonum Mitreola (L.) Britton, Mem. Torr. Bot. Club 5: 258. 1894. *Ophirorrhiza Mitreola* L. Sp. Pl. 150. 1753.

One to several dm. tall; leaves shortly petioled, ovate-lanceolate, acute, membranous, often 3 or 4 cm. long, about half as wide; corolla little longer than the slender calyx lobes, somewhat funnelform.

Junín: Puerto Yessup, *Killip & Smith 26348.* To Central America and Florida.

6. STRYCHNOS L.

Reference: Krukoff & Monachino, Brittonia 4: 248–322. 1942.

Lianas, rarely shrubs, usually with tendrils or thorns or both, the 3–7-plinerved (rarely pinnately nerved) leaves with lineaform stipules, the inflorescence axillary or (and) terminal, the opposite branches with corymbose, globose to thyrsoid racemose flower clusters. Flowers 4–5-merous, rotate to tubular, often pubescent, especially within, stamens usually short, sometimes exserted. Ovary ordinarily 2-celled and many-ovuled, style often long, stigma rarely 2-lobed or conical. Fruit a berry, the pulp soft but with coriaceous or ligneous pericarp, the seeds many or only 1 or 2.—Determinations, unless noted, by Krukoff, from whose greatly detailed and lucidly presented revision with Monachino I have freely copied or compiled with thanks. It may be noteworthy that there are two different forms of anthers, one rounded basally, the other attenuate.

The authors at the time of their revision noted that *S. toxifera, S. guianensis* and *S. Castelnaeana* provided from the bark the main ingredients of the Indian preparation for arrow poisoning known as Curare but as many as twelve species are supposed to be used. Literature cited by the authors, l.c. 321–322, includes papers on the components of Curare, notably two by Krukoff and A. C. Smith, Bull. Torrey Club 64: 401–409. 1937, and 66: 305–314. 1939. All the Peruvian species are lianas usually in age on several trees and often attaining 30 or 50 meters.

KEY (after Krukoff and Monachino)

Corolla tube clearly longer than calyx, at least as long as lobes; style more than three times as long as ovary; anthers glabrous or basally attenuate.

  Corolla tube longer than lobes; filaments none or anthers less than 1 mm. long or attenuate at base; leaves drying yellow if inflorescences axillary.

    Leaf nerves deeply impressed above, the secondary laxly reticulate; flowers unknown.

      Leaves usually longer than 13 cm., brown-red hirtellous beneath as branchlets and petioles.........*S. javariensis.*

      Leaves usually shorter than 13 cm., subglabrous, petioles not brown-red hirtellous...................*S. solimoesana.*

    Leaf nerves and other characters not concomitant as above.

      Inflorescences terminal; leaves usually not drying yellowish.

        Anthers about 1.75 mm. long, attenuate at base; corolla tube glabrous.........................*S. asperula.*

        Anthers shorter than 1.5 mm., basally rounded; corolla tube pilose within.

          Filaments not distinct (not obvious).

            Corolla tube glabrous; calyx lobes 1 mm. long, ciliate. *S. Barnhartiana.*

            Corolla tube strigose; calyx lobes to 2 mm. long, subsetulose.

              Pedicels short; corolla lobes lanate within. *S. diaboli.*

              Pedicels to 3.5 mm. long; corolla lobes glabrous within. *S. brachiata.*

          Filaments distinct, sometimes short.

            Corolla tube except at throat, and lobes all over within, pilose; anthers subsessile........*S. rondeletioides.*

Corolla tube glabrous at throat, lobes not completely pilose; anthers and filaments subequal. *S. toxifera.*

Inflorescences axillary; leaves usually yellowing in age.

Anthers attenuate at base, pilose; corolla tube glabrous. *S. Jobertiana.*

Anthers rounded basally, glabrous; corolla tube pilose within.

Style pilose............................*S. amazonica.*

Style glabrous.

Corolla lobes pubescent within above lanate base.

Corolla tube pubescent; calyx lobes ovate-deltoid. *S. Peckii.*

Corolla tube glabrous without; calyx lobes ovate-lanceolate.....................*S. Smithiana.*

Corolla lobes essentially glabrous above lanate base.

Corolla pubescent without.......*S. Mitscherlichii.*

Corolla glabrous without.

Calyx lobes acute, glabrous or puberulent without.

Corolla tube glabrous at throat as calyx lobes within.................*S. Mitscherlichii.*

Corolla tube pilose at throat; calyx lobes puberulent within...............*S. Erichsonii.*

Calyx lobes acuminate, puberulent without. *S. darienensis.*

Corolla tube and lobes subequal; filaments as basally rounded anthers longer than 1 mm.; inflorescences axillary; leaves not drying yellow.

Pubescence obvious; leaves 1.5–9 cm. long.......*S. guianensis.*

Pubescence obscure; leaves 5–20 cm. long.......*S. panurensis.*

Corolla tube at most as long as calyx, clearly shorter than lobes; style less than 3 times as long as ovary; anthers rounded basally, usually pilose.

Inflorescences axillary; corolla lobes lanate all over within. *S. parviflora.*

Inflorescences terminal; corolla lobes lanate lined within.

Leaves 1.5–3 dm. long, impressed above.......*S. Castelnaeana.*

Leaves shorter than 1.5 dm., smooth above.

Pedicels short but obvious; inflorescences not congested.

Petioles 1–3 mm. long, leaves 2–8 cm. long. . *S. tarapotensis.*

Petioles 2–7 mm. long, leaves often longer. . . . . *S. nigricans.*

Pedicels none or very short; inflorescences congested.

Peduncles elongate; calyx lobes lanceolate, 2 (–2.5) cm. long. *S. Poeppigii.*

Peduncles none or short; calyx lobes linear-lanceolate, 2–4 mm. long. . . . . *S. longisepala.*

Strychnos amazonica Krukoff, Brittonia 4: 284. 1942.

Often 30 meters long and about 6 cm. in diameter; petioles about 8 mm. long, early very sparsely puberulent; leaves usually elliptic to lanceolate, rounded to obtuse or acute at base, abruptly short acuminate, 6–15 cm. long, 2.5–8.5 cm. broad, lustrous and essentially glabrous both sides but with conspicuous crowded whitish dots beneath and sometimes unevenly tuberculate above, often drying yellow, coriaceous, usually 3-plinerved, the inner pair subopposite or alternate and diverging 4–15 mm. from base, reticulation ordinarily prominent, especially beneath; inflorescences in axillary clustered congested cymes, sparsely puberulent with appressed rusty trichomes, pedicels very short or none; calyx lobes broadly ovate, obtuse, ciliate, rarely with a few trichomes without, less than 1 mm. long; corolla tube to 8 mm. long, papillose and glabrous without, pilose within, except at throat itself, the lobes papillose and glabrous without, densely barbate at base within; anthers sessiloid, less than 1 mm. long; styles sparsely pilose.—Flowers white; fruits red according to the collector.

Loreto: Gamitanacocha, Río Mazán, *Schunke 131*, type. Amazonian Brazil. "Cototongoro."

Strychnos asperula Sprague & Sandw. Kew Bull. 131. 1927; 266.

Flowering branchlets with cataphylls at their bases; petioles 4–8 mm. long; leaves ovate or elliptic, cuneate or rounded at base, short-acuminate, 8–10 cm. long, 3.8–5 cm. wide, scarcely lustrous either side, glabrous but asperous above with crowded elevated tubercles, thin-coriaceous, 3-plinerved, the additional pair with basal marginal nerves rather prominent, the inner pair opposite or nearly and diverging 3–9 mm. from base, the reticulation finely raised, especially above; cymes terminal, broadly corymbose, densely flowered, the pubescent branches acutely angled, bracts 1–2.5 mm. long, ciliate, peduncles 1.5–2.5 cm. long, glabrous, pedicels very short; calyx lobes ovate to ovate-lanceolate, about 7.5 mm. long, obtuse, ciliate; corolla tube 8.5 mm. long, glabrous, not papillose, the lobes 2.5 mm. long, glabrous without, cinereous-papillose within, especially toward margins and apex; anthers oblong-oblanceolate, acuminate at base, about 1.75 mm. long, exserted, the filaments very short; style glabrous.—After Krukoff and Monachino from the original description. Illustrated, Hook. Icon. Pl. *pl. 3224.*

Río Acre: Seringal San Francisco, (*Ule 9838*, type).

Strychnos Barnhartiana Krukoff, Brittonia 4: 268. 1942.

Bark, even on small branches, rough, sordid white or grayish, the stems to nearly 9 cm. in diameter, sometimes 30 meters long, branchlets glabrous or pale rusty puberulent as the petioles, these 5–10 mm. long; leaves variable in shape, elliptic, oblong or elliptic-ovate to lanceolate, rounded or obtuse to attenuate and acute at base, acuminate, 6–13 cm. long, 3.5–6.5 cm. wide, usually opaque both sides, drying olive-ochre-yellow, more or less puberulent beneath, the trichomes sometimes elongated in the axils of the inner principal nerves, smooth or tuberculate above, now and then puberulent on midrib and nerves near base, coriaceous, 3–5-plinerved, the inner pair subopposite or alternate, diverging at or near base, the reticulation obscure and lax to rather prominent both surfaces; cymes terminal, subhemispheric, many-flowered, about 4 cm. long and somewhat broader, glabrescent, the pedicels to 2 mm. long; calyx lobes deltoid-ovate to deltoid-lanceolate, about 1.7 mm. long, acute, glabrous but ciliate; corolla tube about 7 mm. long, papillose and glabrous without, pilose within except at throat, the lobes to 3 mm. long, papillose and glabrous without, densely lanate only at base within but closely papillose; anthers sessiloid, oblong, shorter than 1 mm.; style glabrous.—Commemorates the able and genial bibliographer of the New York Botanical Garden.

Peru (doubtless, as also in adjacent Colombia, author). Amazonian Brazil.

Strychnos brachiata R. & P. Fl. Peruv. 2: 30, *pl. 157.* 1799; 269. *S. Ruizii* Sprague & Sandw. Kew Bull. 130. 1927.

To 30 meters long; petioles 5 mm. long, pubescent with straight and curved trichomes intermixed, glabrescent in age; leaves usually elliptic-lanceolate, obtuse to acute at base, subacute to acuminate, 6–13 cm. long, 2.5–5.5 cm. wide, ordinarily lustrous both sides, early strigose or hirtellous on principal nerves and sometimes near margins beneath, also often tuberculate as sometimes above where sparsely pubescent with fulvous curved trichomes on midrib, the margins ciliate, finally subcoriaceous, 3-plinerved, the inner pair mostly alternate and diverging 1–15 mm. from base, the reticulation in age rather prominent both sides; cymes terminal, corymbose, subsetulose, with more or less appressed fulvous hairs, the bracts lanceolate, peduncles to 2.5 cm. long, pedicels to 3.5 mm. long, calyx lobes lanceolate, acute, about 2 mm. long, more or less appressed pubescent without and ciliate; corolla tube to 1 cm. long, papillose and densely fulvous strigose without, pilose within except at base and throat, the lobes strigose without, papillose and glabrous within, not barbate; anthers sessiloid, oblong, over 1 mm. long, more than twice as long as broad, exserted for the greater part; style glabrous; fruits globose, about 3.5 cm. in diameter, the shell corky and fragile, yellowish-green, the pulp yellow; seeds about 4, suborbicular, flattened, variously angulate, glabrous with an ashy fragile covering.—Krukoff and Monachino note that the Ruíz and Pavón plate is at variance in several respects from the type collection as herewith described by them from their own observation; *S. Ruizii*, not seen by the present authors, is said to have corolla tube 12 mm. long, calyx lobes 2.5–2.75 mm. long, variable characters. F.M. Neg. 26794.

Huánuco: Pozuzo, *Ruíz & Pavón*, type. Bolivia; Colombia. "Taruca-miccuna," "comida de venados."

Strychnos Castelnaeana Wedd. in Castelnau, Exped. Amer. Sud. 5: 22. 1851; 307. *S. Castelnaei* Wedd. ex Benth. Journ. Linn. Soc. 1: 108. 1856.

Usually 10 or 12 meters long, about 3.5 cm. in diameter, the nodes markedly thickened, the bark fairly smooth, inner pale orange, dark brown on exposure; branchlets as petioles, these 3–8 mm. long, densely fulvous-tomentose; leaves broadly ovate or orbicular to elliptic-lanceolate, rounded or subcordate at base, usually short-acuminate from a rounded or somewhat narrowed apex, 1.5–3 dm. long, 7–21 cm. wide, coriaceous, dull both sides and usually rusty subhirtellous or velutinous beneath as above when young, often tuberculate from bases of fallen trichomes, ordinarily 5-plinerved, the inner pair alternate, diverging at 3 to 30 mm. from base, the reticulation as the nerves deeply impressed above, conspicuous beneath; cymes densely congested, corymbose to short thyrsoid, closely fulvous-tomentose, the apical bracts lanceolate, widely divaricate, the secondary and tertiary progressively shorter, becoming ovate and glabrous within, the bracteoles crowded beneath calyx; peduncles 2.5 mm. wide, pedicels obsolete; calyx lobes broadly ovate, more or less acute, erect, about 1 mm. long, papillose without, pubescent toward base, ciliate; corolla lobes erect, papillose without, the papillae often elongate into trichomes, rather densely long-lanate medially within along an upwardly convex arc above which the lobes are not papillose but carinate and below which they are obscurely papillose, often with a few marginal trichomes; anthers conspicuously barbate, filaments often pilose near base and at insertion; ovary and styles glabrous; fruits globose, about 2 cm. in diameter, the dull shell somewhat reticulate or tuberculate, seeds usually 2, oval, about 16 mm. long, 5 mm. thick, convex on both faces, the pedicels about 3 mm. thick.—After Krukoff and Monachino, as other descriptions. Illustrated, Arch. Mus. Nac. Río 15: *pl. 1.* F.M. Neg. 38937.

Loreto: Pebas, *Castelnau,* type. Brazil. "Ramou."

Strychnos cogens Benth. in Hook. Journ. Bot. 3: 241. 1841; 303.

Liana often attaining more than 30 meters and 1 dm. in diameter; petioles 4–7 mm. long, early densely and minutely rusty-subsetulose, glabrescent in age as the leaves, these often also tuberculate above, broadly elliptic-ovate to narrowly lanceolate, usually obtuse at base, acuminate, 4–15 cm. long, 2–6.5 cm. wide, chartaceous to coriaceous, dull to lustrous both sides, drying gray-green or brownish, 3 (5) -plinerved, the inner pair subopposite or alternate and diverging at or near the base, the reticulation obscure or somewhat prominent; cymes congested, sometimes 1.5 cm. long, fulvous subsetulose, bracts ovate-lanceolate, acute, deeply concave, pedicels short or none, becoming thicker; calyx lobes ovate to ovate-lanceolate, acute to short-acuminate, erect, to 2 mm. long, papillose and puberulent without, sometimes pubescent toward apex within, ciliate, finally incrassate at base; ovary glabrous but style basally pilose; fruits globose, about 1.8 cm. in diameter, yellowish lustrous, reticulate, the 1 or 2 seeds usually orbiculate, about 11 mm. in diameter, somewhat convex on both faces, the pedicels about 2.5 mm. thick.

Peru (doubtless as also in Colombia, Krukoff). To British Guiana.

Strychnos darienensis Seem. Bot. Voy. Herald 166. 1854; 293.

Petioles 2–6 mm. long, early puberulent or subsetulose; leaves "elliptic, lanceolate, oblanceolate or ovate," rounded or subcordate to obtuse or acute at base, usually short-acuminate, 5–18 cm. long, 2.5–9.5 cm. wide, subcoriaceous, most often dull both sides and essentially glabrous in age except conspicuously barbate in axils of inner principal nerves, when young also more or less puberulent, frequently drying olive-ochre yellow, 3 (5) -plinerved, inner pair diverging 5–25 mm. from base, usually obscurely reticulate; inflorescences in short axillary panicles, densely fulvous-puberulent to subsetulose with appressed or ascending trichomes, the pedicels about as long as calyx, this with acuminate lobes around 1.5 mm. long; corolla papillose and glabrous without, the tube pilose within, the lobes lanate at base within, otherwise glabrous; anthers sessiloid; style glabrous; fruits globose, about 4 cm. in diameter, lustrous, smooth or somewhat tuberculate, the many irregularly oblong seeds 2 cm. long, 1.5 cm. broad, 4 mm. thick, the pedicels about 4 mm. in diameter.—F.M. Negs. 38866; 3870 (as *S. Ulei* Gilg in herb.).

Loreto: Río Itaya, *Williams 222*.—Río Acre: *Ule 9695*. Bolivia to British Guiana and Central America.

Strychnos diaboli Sandw. Kew Bull. 486. 1931; 278.

Liana often 40 meters long, a dm. or so in diameter, the bases of the branchlets often with conspicuous cataphylls; petioles (2–7 mm. long), branchlets persistently, leaves early and the compact short-thyrsoid or corymbose cymes densely rusty-pubescent or subsetulose with short more or less appressed trichomes, the leaves in age shortly puberulent beneath and usually punctate, glabrescent above; leaves ovate, elliptic or obovate, obtuse, rounded or subcordate at base, short-acuminate or acute to rounded and mucronulate at apex, coriaceous in age, usually lustrous above, sometimes drying olive-ochre yellow, ordinarily 5-plinerved, the inner pair opposite to alternate, diverging 6–30 mm. from base, well impressed above; pedicels short or none, calyx lobes ovate, subacute, about 2 mm. long; corolla tube to 8 mm. long, papillose and setulose without as also lobes, densely pilose within except at base and throat, lobes densely lanate only at base within, otherwise papillose and glabrous; anthers sessiloid, included, over 1 mm. long; style glabrous.

Peru (doubtless; and also in adjacent Colombia: Krukoff). Amazonian Brazil; British Guiana.

Strychnos Erichsonii Rich. Schomb. ex Mart. Fl. Bras. 6, pt. 1: 274. 1868; 287.

Liana known to attain 60 meters and a diameter of 3 dm.; branchlets, petioles (2–13 mm. long) and leaves beneath, except in age, and panicles—these also terminal and to 2.5 cm. long—more or less densely fulvous-puberulent with very short trichomes; leaves suborbicular to elliptic, lanceolate or oblanceolate, rounded to obtuse at base, usually abruptly short-acuminate, 7–26 cm. long, 3.5–13 cm. wide, commonly concolored, the older often yellowish in drying, coriaceous, often tuberculate and puberulent above on midrib, 3–5-plinerved, the inner pair diverging to 10 mm. from base, reticulation more or less prominent; pedicels shorter than or subequaling calyx, this with broadly deltoid subacute lobes about 1 mm. long, ciliate and puberulent at least within; corolla tube to 8 mm. long, papillose and glabrous without (as lobes), pilose within medially to throat and lanate bases of lobes, these sometimes also with a few scattered trichomes; filaments about a fourth as long as the slightly exserted anthers; style glabrous; fruits irregularly spheroid (known), 3.5 cm. in diameter, smooth or minutely tuberculate, the many seeds to 2 cm. long, 12 mm. wide, 6 mm. thick.

Peru (doubtless, Krukoff). Colombia to the Guianas.

Strychnos guianensis (Aublet) Mart. Syst. Mat. Med. Bras. 121. 1843; 296. *Rouhamon guianensis* Aublet, Pl. Guian. 1: 93. 1775.

Now and then attaining more than 40 meters, the branchlets and petioles (2–6 mm. long) typically densely subsetulose, leaves beneath and the short-racemose cymes more or less subsetulose with short often rusty appressed or ascending trichomes; leaves very variable in shape, subcordate to cuneate at base, rounded to acuminate at apex, 3–9 cm. long, 1.5–4.5 cm. wide, mucronulate, submembranous to subcoriaceous, glabrescent above in age, pubescence beneath sometimes spreading and dense to barbate in the axils of the principal nerves, 3 (5) -plinerved, the inner usually alternate pair diverging 0–13 mm. from base, the reticulation ordinarily obscure; pedicels to 4 mm. long; calyx lobes variable, less than 1 mm. long to 1.5 mm. long, subacute to acuminate, usually finally glabrous but more or less ciliate; corolla lobes lanate on the lower half within, glabrous or sometimes with a few trichomes but well papillose on the upper half; ovary as style glabrous; fruits subovate or oblong, about 13 mm. in diameter, yellow, usually lustrous, sometimes finely tuberculate, with 1 or 2 seeds, the pedicels about 1.5 mm. in diameter.—The var. *trichina* Macbr., Candollea 5: 401. 1934, was proposed for an aberrant specimen, the lower leaves often scarcely or not acute, rather subcordate, the branchlets glabrous or glabrate. A highly variable species as understood by Krukoff and Monachino, who give an extensive probable synonymy.

Loreto: Manfinfa, upper Río Nanay, *Williams 1102* (type, var.). To southern Brazil and the Guianas.

Strychnos javariensis Krukoff, Brittonia 4: 279. 1942.

Known only vegetatively but apparently intermediate in character to *S. diaboli* and *S. Castelnaeana;* branchlets and petioles, these 4–7 mm. long, densely ferrugineous hirtellous with mostly spreading, rather stiff trichomes; leaves elliptic-lanceolate or elliptic-orbicular, rounded to obtuse at base, more or less acuminate, 13–19 cm. long, 5–11.5 cm. wide, coriaceous, dull both sides, drying in part olive-ochre yellow, early densely, finally sparsely pubescent and tuberculate beneath from bases of fallen trichomes, more or less setulose above, 5–7-plinerved, the inner usually alternate, diverging 1–2 cm. from the base, deeply as secondaries impressed above, the reticulation there very lax, faint but more obvious beneath.—Often more than 50 meters long, mostly a dm. thick or larger, the inner wood orange and retaining the color long after exposure; the nodes are not pronounced (author).

Bark occasionally used as a secondary ingredient of Curare by the Javas in Peru and Brazil (Krukoff).

Peru (doubtless). Amazonian Brazil.

Strychnos Jobertiana Baillon, Adans. 12: 367. 1879; 281.

Often about 30 meters long, 7.5 cm. in diameter, the bark grayish-white; petioles 5–15 mm. long; leaves broadly or narrowly subelliptic or suboblong, broadest above or below the middle, obtuse to acute at base, obtuse to more or less acuminate or even caudate, about 1–2.5 dm. long, 4.5–15 cm. wide, often somewhat lustrous, finally coriaceous, essentially glabrous, but densely white-dotted beneath, usually 3-plinerved, the inner subopposite pair diverging at (or nearly at) base, reticulation to prominent on both sides; cymes axillary, short-thyrsoid or corymbose, compact, sparsely fulvous puberulent to glabrescent, the pedicels shorter than calyx or none; calyx lobes ovate, usually obtuse or rounded, less than 1 mm. long, ciliate but glabrous or nearly; corolla tube to 1 cm. long, not papillose, entirely glabrous as lobes without, these sparsely pilose only marginally within; anthers sessiloid, somewhat exserted, oblong-oblanceolate, acuminate, about 1.75 mm. long, with several trichomes at base; style pilose; fruits globose (immature about 5 cm. in diameter), dull with minute facets, the granulated mesocarp often exposed, the seeds many; fruiting pedicels to 11 mm. thick.—According to Krukoff and

A. C. Smith, this is used as a secondary ingredient of Curare by the Javas in Brazil and Peru while Gilg recorded the same use (roots as well as bark) by the Canelos in Ecuador.

Peru (doubtless, Krukoff). Colombia; Ecuador; Amazonian Brazil.

Strychnos longisepala Krukoff, Brittonia 4: 317. 1942.

Resembles closely *S. Poeppigii* but petioles to 3 mm. long, leaves 2–8 cm. long, 1.5–4 cm. wide, usually acutely acuminate, inner pair of nerves diverging 1–11 mm. from base, peduncles lacking or shorter than flower-clusters and, especially, calyx lobes linear-lanceolate, 2–4 mm. long, drying black; fruits globose, about 12 mm. in diameter, lustrous, smooth, the 1 (or 2?) spheroid seeds 7–10 mm. long, brownish and translucent, sometimes covered with tomentum formed in endocarp, the pedicels about 1 mm. thick.

Loreto: Río Nanay, *Williams 597*. La Victoria (boundary), *Williams 2540*, type. Río Ucayali, *Tessmann 5488*. Amazonian Brazil. "Cunchuguaia."

Strychnos Mitscherlichii Rich. Schomb. Reisen 2: 451. 1848; 291. *S. smilacina* Benth. Journ. Linn. Soc. 1: 105. 1856, fide Sandwith.

Branchlets sparsely puberulent, the stipules also slightly ciliate; petioles—these 3–12 mm. long—as leaves beneath more or less short-puberulent unless in age and often (typically weakly) barbate in the axils of the principal nerves; leaves usually broadly ovate to narrowly lanceolate, rounded to obtuse at base but often decurrent, somewhat narrowed to long-acuminate at apex, 4–22 cm. long, 3.5–10.5 cm. wide (as observed to 1942 by the monographers), lustrous both sides and glabrous above unless puberulent near base, coriaceous, often drying olive-ochre or vivid russet-brown when old, 3–5-plinerved, the inner pair diverging 2–15 mm. from base; cymes axillary, dense, hemispheric to short-thyrsoid, glabrous to sparsely puberulent, bracts ciliate, pedicels short; calyx lobes ovate-lanceolate, unequal, about 1 mm. long, acute or somewhat rounded, glabrous to more or less puberulent and ciliate; corolla tube to 8 mm. long, glabrous and papillose without (as lobes), pilose within except at base and at throat itself, the lobes within papillose from apex for about three-quarters the length but lanate below (except at very base) along an upwardly convex arc; anthers sessiloid, partly exserted, about 1 mm. long; style glabrous; fruits globose, 3.5 cm. in diameter, variously tuberculate, the many seeds about 2 cm. long, 12 mm. broad, to 6 mm. thick, the membranous scales partly adhering or leaving a rugulose surface, the pedicels to 8 mm. thick.—Var. *pubescentior* Sandw., Brittonia 3: 91. 1938, is the Peruvian form, leaves beneath conspicuously barbate in axils, corolla tube papillae elongated. Typically largely confined to high ground. The variety from creek or river margins may prove to be distinct (Krukoff), but *S. guianensis* and probably other species are not restricted in habitat.

Loreto: Maquisapa, upper Río Nanay, *Williams 1220.* Bolivia to Ecuador and the Guianas.

Strychnos nigricans Prog. in Mart. Fl. Bras. 6, pt. 1: 280. 1868; 315.

Branches with few, usually curved spines, lenticellate; branchlets puberulent with rather long generally curved trichomes; petioles 2–7 mm. long; leaves ovate-lanceolate to lanceolate or oblanceolate, rounded to acute at base, acutely acuminate, 2.5–15 cm. long, 1–4 cm. wide, membranous to chartaceous, dull both sides, sparsely puberulent on the principal nerves beneath but often barbate or with membranes in their axils, otherwise glabrous, at least in age, 3-plinerved, the inner pair diverging 1–13 mm. from base, the reticulation faint both sides; inflorescences in paniculate cymes, usually hemispheric, many-flowered, pale rusty or gray-puberulent with rather long, usually ascending and slightly hooked trichomes, bracts long-acuminate, glabrous but ciliate, pedicels at most as long as calyx; calyx lobes often unequal, slightly longer than 1 mm., acute to long-acuminate, sparsely ciliate; corolla lobes obscurely papillose without, rather densely long-lanate within near middle toward base, above this line of barbation papillose and glabrous, below it neither pilose nor papillose; anthers glabrous or pilose; ovary as style glabrous; fruits lustrous, smooth, endocarp developing a thick pale wool adhering to seed (1?), this spheroid, brownish and translucent (wool removed), pedicels (of immature fruit) about 2 mm. thick.

Loreto: Río Itaya, *Williams 11.* Brazil; Venezuela.

Strychnos panurensis Sprague & Sandw. Kew Bull. 132. 1927; 301. *S. placida* Macbr. Candollea 5: 400. 1934, fide Krukoff & Monachino.

An erect shrub becoming scandent above; branchlet tips, petioles (4–10 mm. long) and leaves beneath, at least on the principal nerves, puberulent with minute or very short appressed to erect (on nerves) trichomes; leaves elliptic-obovate to oblanceolate or ovate to lanceolate, rounded to acute or broadly cuneate at base, abruptly short-acuminate or caudate, 5–20 cm. long, 4–7.5 cm. wide, drying grayish-green (petioles orange-brown), glabrous above, chartaceous to coriaceous, 3–5-plinerved, the inner pair diverging 2–12 mm. from base, deeply impressed above, the more or less prominent reticulation finely intricate; panicles usually elongate (1.5–7 cm. long), the nodes of the opposite branches often distant, puberulent or hirtellous with pale spreading or ascending trichomes, the pedicels to 2 mm. long; calyx lobes deltoid-ovate, acute, spreading, papillose, 1 mm. long, corolla lobes densely lanate all over within; ovary as style glabrous; fruits ellipsoid, 2 cm. long, 12 mm. thick, lustrous, smooth, the solitary seed about 14 mm. long, 10 mm. broad, the membranous squamae adhering.

San Martín: Chazuta, *Klug 4082*.—Loreto: Puerto Arturo, *Williams 5312* (type, *S. placida*). To Colombia and Venezuela.

Strychnos parviflora Spruce ex Benth. Journ. Linn. Soc. 1: 107. 1856; 306.

Often 40 meters long, to a dm. thick with puberulent branches, petioles (about 1 cm. long) and leaves beneath, the trichomes very short and appressed; branchlets of juvenile plants often hirsute with long spreading trichomes; leaves elliptic-oblong, rounded to obtuse at base, usually abruptly acuminate, 8–18 cm. long, 3.5–9 cm. wide, markedly glaucescent beneath with the petioles drying blackish, glabrous above except for midrib near base, coriaceous, 3-plinerved, the inner pair usually subopposite, and diverging 3–10 mm. from base; inflorescences axillary, greatly elongate and paniculate, many-flowered, densely appressed puberulent, the trichomes brownish-ferrugineous, the pedicels obsolete; calyx lobes ovate, subrounded, about 0.5 mm. long; corolla lobes papillose and glabrous without, lanate all over within; anthers barbate at base and with tufted trichomes at tip; ovary broader than long, truncate, glabrous, the style puberulent, shorter or about as long as the sharply pointed conical stigma; fruits about 23 mm. long, 2 cm. broad, smooth or warty, rather dull, the pedicels about 5 mm. thick.—Apparently unique among American species in the characteristic stigma (Krukoff & Monachino).

Peru (doubtless, as also at least in adjacent Colombia, Krukoff). Amazonian Brazil.

Strychnos Peckii B. L. Robns. Proc. Am. Acad. 49: 504. 1913; 285. *S. gigantea* Barb. Rodr. Vellosia, ed. 2, 1: 37, *pl. 3, fig. A.* 1891?

Robust liana, occasionally about 60 meters long, 1.5–2 dm. thick, the white or yellowish flowers fragrant; branchlets, petioles (5–18 mm. long) and leaves beneath early densely or evenly appressed puberulent, this indument more or less persisting, often in part as punctae; leaves usually elliptic or elliptic-lanceolate or oblanceolate, rounded to obtuse at base, ordinarily rounded and abruptly short-acuminate (sometimes acuminate), 7–35 cm. long, 3.5–17 cm. wide, now and then lustrous above and drying ochre-yellow, thickly coriaceous in age, 3 (5) -plinerved, the inner pair diverging at 2–5 (–10) mm. from base, the lax reticulation faint or little prominent either side; cymes axillary, clustered, subglobose, compact, fulvous-puberulent, the trichomes appressed or erect, pedicels to 2 mm. long, calyx lobes ovate-deltoid, somewhat acute, about 1 mm. long, densely puberulent without and ciliate; corolla tube to 9 mm. long but usually much shorter, densely papillose without and pubescent with usually thick short erect trichomes, pilose within from below middle to throat, lobes long-papillose or pubescent without, lanate (most densely basally) within; anthers sessiloid, only tip exserted, to 1.5 mm. long, about 3 times as long as broad; style glabrous; fruits about 6 cm. in diameter, dull, reticulate and smooth or warty, the many elliptic-oblong seeds 2.5 cm. long, 18 mm. wide, 6 mm. thick, the pedicels to 2 cm. in diameter.—Named for collector of the type and author of the excellent *Flora of Oregon.*

Peru (undoubtedly). Bolivia to Central America and British Guiana.

Strychnos Poeppigii Prog. in Mart. Fl. Bras. 6, pt. 1: 282, *pl. 80.* 1868; 316.

Branchlets and petioles—these to 1 mm. long—puberulent when young with short gray erect or ascending trichomes; leaves ovate to ovate-lanceolate, usually rounded at base, obtusely short-acuminate, about 4.5 cm. long, 2 cm. wide, membranous to chartaceous, dull both sides, paler and early beneath puberulent on the principal nerves (3–5-plinerved), sometimes barbate in the axils of the inner pair, these diverging 1–8 mm. from base, often also with long membranes, reticulation faint both sides; cymes spherically clustered, less than 1 cm. long, sparsely gray puberulent with spreading sometimes slightly barbed trichomes, bracts narrowly lanceolate, acute, peduncles about 2 cm. long, pedicels obsolete; calyx lobes about 2 to 2.5 mm. long, acute or acuminate, finally recurved at tip, sparsely puberulent both sides; corolla lobes papillose and glabrous without, lanate near middle within along an arc with marginally scattered trichomes toward sinuses, otherwise glabrous but papillose above; anthers pilose at base; ovary apically and style basally puberulent or glabrous (Williams); fruits orbicular, flattened laterally, about 6 mm. thick, the solitary orbicular seed greatly flattened, testa glabrous, the fruiting pedicels scarcely incrassate (description of fruits after Progel).

Loreto: Puerto Arturo, *Williams 4985.* Yurimaguas, *Poeppig,* type.

Strychnos rondeletioides Spruce ex Benth. Journ. Linn. Soc. 1: 104. 1856; 266.

Petioles, these 5–10 mm. long, leaves beneath, especially early, and the terminal cymes densely puberulent, the appressed trichomes usually fulvous; leaves subelliptic, ordinarily broadest below the middle, rounded to acute at base, usually short-acuminate, 7–16 cm. long, 4–9.5 cm. wide, coriaceous, in age glabrescent and often drying olive-ochre yellow, 3- or 5-plinerved, the inner mostly alternate pair diverging 5–10 mm. from base, minutely (sometimes obscurely) whitish puncticulate beneath, rarely tuberculate above; cymes subhemispheric, compact, peduncles 2–4.5 cm. long, pedicels to 2 mm. long; calyx lobes deltoid-ovate-lanceolate, subacute, ciliate; corolla tube about 8 mm. long, lobes 4 mm. long, both merely papillose without, the former pilose within, the latter lanate-barbate and soft pilose all over within; anthers shorter than 1.5 mm., rounded at base, filaments short but distinct; style glabrous; fruits about 3 cm. long, 2 cm. broad, shell laxly reticulate and tuberculate, pedicels to 9 mm. thick.—Often to 50 meters long, 12 cm. in diameter, the white or yellowish-white flowers fragrant. F.M. Neg. 22754.

Loreto: Mishuyacu near Iquitos, *Klug 1269.* Bolivia to Colombia and Venezuela.

Strychnos Smithiana Krukoff, Brittonia 4: 287. 1942.

Often to 30 meters tall, 1.5 dm. in diameter, the branchlets, petioles—these 6–13 mm. long—leaves beneath except in age and the axillary elongate (to 4 cm. long) panicles densely fulvous-puberulent with appressed trichomes; leaves elliptic, broadly ovate, lanceolate or oblanceolate, rounded to obtuse or subacute at base, abruptly short-acuminate, 7–16 cm. long, 3.5–10 cm. wide, usually lustrous both sides but duller beneath, the younger drying bright russet-brown, the older often olive-ochre-yellow, coriaceous, essentially glabrous and smooth above, 3–5-plinerved, the inner opposite or subopposite pair diverging at 2–10 mm. from base, the reticulation more or less prominent; pedicels short or none; calyx lobes ovate-lanceolate, acute, to 2 mm. long, ciliate, more puberulent within than without; corolla densely papillose and glabrous without, pilose within except at base, the lobes also densely lanate at base within; anthers sessiloid, slightly exserted, less than 1 mm. long; style glabrous.—Size of flowers not indicated. Named in honor of the worthily distinguished director of the National Herbarium.

Peru (doubtless, and also at least in adjacent Colombia, author). Amazonian Brazil.

Strychnos solimoesana Krukoff, Brittonia 4: 280. 1942.

Resembles *S. javariensis* vegetatively (flowers unknown) but indument a mostly appressed puberulence only, the axils of the leaf-nerves beneath often barbate; leaves 8–14 cm. long, 3.5–7.5 cm. wide, lustrous above.—Like the similar species shows affinity to *S. diaboli* (author). Often over 50 meters long, about 7.5 cm. in diameter. Type from São Paulo de Olivença, Brazil.

Peru (doubtless). Amazonian Brazil.

Strychnos tarapotensis Sprague & Sandw. Kew Bull. 131. 1927; 317.

Similar to *S. Poeppigii* but trichomes, especially of cymes, erect; inflorescences in paniculate cymes, corymbose or hemispheric, laxly flowered, the pedicels shorter than calyx but usually distinct, the peduncles to 1 cm. long; calyx lobes about 1.5 mm. long, rarely less than 1 mm. long or as long as 2 mm., glabrous within unless near tip; corolla lobes glabrous (and more or less papillose) except for the medial barbation; anthers sometimes glabrous; ovary apically and style basally puberulent or both sometimes glabrous; fruits globose, about 1.5 cm. in diameter, lustrous, the endocarp developing into tomentous or membranous scales easily removable from testa, the spheroid seeds sometimes much flattened, about 7 mm. long, the pedicels about 1 mm. thick.—According to Krukoff and Monachino the ovary and style are both puberulent in part as to type, while in *Tessmann 3920* and *Klug 3862* both are quite glabrous. F.M. Neg. 3869.

San Martín: Tarapoto, *Spruce 4889*, type; *Williams 6566*. Juanjui, *Klug 3862*.—Loreto: Pongo de Manseriche, *Killip & Smith 29130; Mexia 6180*. Santa Rosa, *Williams 4858*. Puerto Arturo, *Williams 5107; 5111*.—Río Acre: Río Macauhán, *Krukoff 5671*. Amazonian Brazil.

Strychnos toxifera Rob. Schomb. ex Benth. in Hook. Journ. Bot. 3: 240. 1841; 276.

Branchlets, petioles (1–6 mm. long), leaves both sides (unless in age), and the terminal cymes densely hirsute with long spreading rusty trichomes (sometimes mixed with short curved-appressed ones), the longer hollow with a few elongate cells; leaves elliptic to lanceolate, ovate or oblanceolate, subcordate to obtuse, rarely subacute at base, more or less acuminate, 6–20 cm. long, 3–8 cm. wide, membranous to chartaceous, rather dull, especially beneath where usually minutely tuberculate, sometimes coarsely so above, the margins notably ciliate; cymes corymbose, laxly flowered, bracts linear, pedicels to 5 mm. long; calyx lobes linear-lanceolate or subulate, acuminate, to 6 mm. long, hirsute without; corolla tube to 1.5 cm. long, papillose and spreading-hirsute without except near base, pilose within mostly only below the middle, lobes pilose without, densely lanate basally within with short-celled trichomes, papillose all over, densely so apically where often with a few multicelled trichomes; filaments distinct, the anthers exserted, less than 1 mm. long; style glabrous; fruits globose, to about 7 cm. in diameter, bluish-green, smooth, seeds obliquely reniform, about 23 mm. long.—Brazil specimens only to about 10 meters long; a main ingredient of the Curare of British Guiana Indians. Illustrated, Hook. Icon. Pl. 4: *pls. 364, 365.*

Peru (doubtless; also at least in Colombia, Krukoff). To Panama and the Guianas.

7. POTALIA Aublet

Smooth shrubs with long-obovate fleshy leaves and stoutly pedicelled flowers borne in terminal inflorescences. Calyx 4-parted, the coriaceous segments subrotund. Corolla short-tubular. Stamens 8–10, united in the tube, subsessile. Ovary on a fleshy disk, 2-celled above, 4-celled near base, style swollen basally, stigma capitate. Fruit a berry with many seeds.

Potalia amara Aublet, Pl. Guian. 1: 394, *pl. 151.* 1775.

Often a meter tall and unbranched with foliage of *Faramea* or *Condamea* in the Rubiaceae, the inflorescence branches citrus-yellow, the flowers green.

Amazonas: Moyobamba, *Weberbauer 4550.*—Loreto: Pebas, *Williams 1936.* Brazil. "Anabi."

GENTIANACEAE. Gentian Family

Herbs or sometimes more or less ligneous, usually glabrous, sap acrid, leaves ordinarily opposite or verticillate, rarely not entire, exceptionally 3-foliate, stipules none. Flowers commonly hermaphrodite and 4–5-merous, various in color, cymose or solitary; the inflorescence often more or less racemiform. Calyx deeply lobed, often with a disk at base. Corolla generally withering-persistent, cylindric to campanulate or finally rotate, occasionally weakly zygomorphic, the lobes frequently in bud convolute to right, rarely more or less imbricate. Stamens inserted from base of tube to corolla throat, anthers variously attached, at least finally longitudinally dehiscent. Ovary superior, usually 1-celled with 2 parietal placenta, sometimes 2-celled, not at all rarely with a more or less developed glandular basal disk. Fruit almost always a 2-valved septicidal capsule, the incurved edges bearing the many small seeds.

Floating or creeping cordate-leafed herb........1. *Limnanthemum.*
Various in habit and form but not aquatic.
  Leafless saprophytes; style filiform, stigma capitate. 2. *Leiphaimos.*
  Foliose herbs or shrubs.
    Style filiform or slender.
      Anthers erect or finally spiralled.
        Low herb with long-peduncled or subcymose flowers.
          Flower usually 4-merous; anthers cordate-ovate. 3. *Microcala.*
          Flower mostly 5-merous; anthers oblong...4. *Erythraea.*
        Tall herb; flowers subspicate...............5. *Coutoubea.*
      Anthers versatile.
        Ovary essentially 1-celled; slender, the branches often elongate.................................6. *Tachia.*
        Ovary pseudo-2-celled; often stout, branches short or absent (sections *Chelonanthus, Macrocarpaea, Symbolanthus*)..............................7. *Lisianthus.*
    Style short, relatively stout.
      Flowers not spurred..........................8. *Gentiana.*
      Flowers more or less spurred..................9. *Halenia.*

1. LIMNANTHEMUM J. F. Gmelin

Aquatic herb or creeping in wet places with broad alternate (or the upper subopposite) entire or weakly lobed leaves and yellow or white often dimorphic 5-merous flowers. Calyx and corolla deeply lobed, the former frequently with scales near base within, between the short filaments. Ovary 1-celled, style often with 2 broad lobes. Capsule not opening or irregularly, the seeds many.—Unique in corolla aestivation, this subvalvate.

Limnanthemum Humboldtianum (HBK.) Griseb. Gent. 347. 1838. *Villarsia Humboldtiana* HBK. Nov. Gen. & Sp. 3: 187. 1819.

Petioles elongating; leaves submembranous, nearly smooth above, distinctly reddish-glandular beneath, deeply cordate, reticulate-nervose, often about 7 cm. broad; umbels sessile, usually 12–15-flowered; pedicels about 1 cm. long; sepals oblong-linear, obtuse, half as long as infundibuliform corolla, this barbate within and with marginally fimbriate lobes; disk pilose only above; style elongate, the stigma lobes more or less developed; capsules ovoid, enclosed in calyx, the seeds globose, lustrous, scarcely carinate.—F.M. Neg. 37458.

Amazonas: Near Moyobamba, (Weberbauer, 292). Widely distributed in South America to the West Indies.

2. LEIPHAIMOS Cham. & Schlecht.

Delicate saprophytes, lacking chlorophyll, the simple or weakly branched stems with a few scales from filiform rhizome. Flowers 4–5-merous, solitary or few in cymes. Calyx segments not carinate. Corolla tube often elongate, lobes spreading, irregularly splitting in age. Stamens in tube, not exserted, the filaments short. Style filiform, stigma capitate. Capsule usually fusiform, medially septicidal. *Voyria* Aublet is similar; if found within Peru it may be known by its larger flowers, the capsules dehiscent to base.

Flowers 2.5–3.5 cm. long; scales alternate............. *L. aphyllus.*
Flowers about 2 cm. long; scales opposite............ *L. sulphurea.*

Leiphaimos aphyllus (Jacq.) Gilg, Pflanzenfam. 4, Abt. 2: 104. 1895. *Gentiana aphylla* Jacq. Enum. Pl. Carib. 17. 1760.

Rhizomes ascending, squamose; stem about 1 dm. tall or taller, erect, simple, the scales about 2–2.5 cm. distant, ovate, amplexicaul, alternate; flowers 2.5–3.5 cm. long; calyx much shorter than corolla tube, its lobes obtuse; corolla ampliate apically, the ovate tubes acute; ovary cylindric, slightly stiped.—There is a ring of scales between calyx and corolla (Gilg). Flowers yellow with orange base or vivid yellow (Woytkowski).

San Martín: Near Moyobamba, in leaf humus, low forest, *Woytkowski 35297; 35344* (det. Cuatrecasas); *Weberbauer 4656*.—Huánuco: Chicoplaya, (*Ruiz & Pavón?* under an ined. name).—Cuzco: Upper Valley, Río Sambray, Prov. Convençion, *Mexia 8068* (det. Standley). Colombia.

Leiphaimos sulphurea (Prog.) Gilg, Pflanzenfam. 4, Abt. 2: 104. 1895. *Voyria sulphurea* Prog. in Mart. Fl. Bras. 6, pt. 1: 221. *pl. 60, fig. 4.* 1865.

Stem simple, 1-flowered, to 1 dm. high, the lower internodes 4–6, the upper 8–12 mm. long; scales opposite, obtuse, high-connate, the upper lanceolate, the lower ovate; calyx 8 mm. long, medially 5-lobed, naked at base, the prominent nerves extended into the narrowly acutely acuminate or subsetaceous teeth; corolla salverform, tube subcylindric, twice as long as calyx, sulphur color, puberulent above, the lanceolate acute lobes half as long as tube; filaments slightly longer than anthers, inserted near summit; anthers oblong, connate, caudiculate; ovary lanceolate, eglandular, style filiform; stigma capitulate; capsule dehiscing medially.—Flowers yellow; floor of dense forest.

Loreto: Sierra del Pongo, *Mexia 6188a* (det. Standley, with query). Amazonian Brazil.

3. MICROCALA Link & Hoffm.

Little, simple-stemmed annual, or sometimes with a branch or two, the solitary terminal flower 4-merous. Stamens inserted in throat of the short salverform corolla, the anthers cordate-ovate. Stigma lobes fan-shaped, finally separating.

Microcala quadrangularis (Lam.) Griseb. in DC. Prodr. 9: 63. 1845. *Gentiana quadrangularis* Lam. Encycl. 2: 645. 1788.

Stems and branches filiform, 2–7 cm. high, the peduncles 2–5 cm. long; leaves 1–3 pairs, elliptic-oblong, acute, 3–7 mm. long; calyx especially in age nearly quadrate, the obconic tube truncate, the 4 nearly minute teeth subulate, finally to 5 or 6 mm. long, almost as broad at tip; corolla yellow or pink-yellow, about 7 mm. long or about twice as long as the calyx at anthesis, the oblong obtuse lobes subequaling the membranous tube; capsule ellipsoid.—Flowers said to close after mid-day. A species of the lomas (Weberbauer, 105); also at 7° 10′ near San Pablo (Weberbauer, 257).

Lima: Amancaës, *Ruíz & Pavón*, type (Weberbauer, 145). Prov. Canta, *Mathews 509*.—Arequipa: Near Mejia, (*Guenther & Buchtein 167*). Chile; California.

4. ERYTHRAEA L. C. Rich.

Herbs with sessile often amplexicaul opposite leaves and roseate, white or yellow 5 (or 4) -merous flowers in dense or lax cymes, rarely in pseudo-racemes. Calyx more or less campanulate, the lobes carinate. Corolla lobes spreading. Stamens affixed to tube, the short filaments filiform, the anthers frequently exserted and after anthesis somewhat spiralled. Ovary 1-celled, the slender style with lamellate or globose stigmas. Capsule septicidal, the edges of the 2 parts strongly incurved.

Leaves broadly oval	*E. lomae.*
Leaves narrowly oblong	*E. quitensis.*

Erythraea lomae Gilg, Repert. Nov. Sp. 2: 34. 1906.

Annual, 7–12 cm. tall, simple or often branched from base, all the branches strictly erect, subtetrapterous; leaves 1–3 cm. distant, ovate-orbicular, broadly rounded at base, often subacute, 7–18 mm. long and nearly as wide, thin-membranous, manifestly 5–7-nerved; cymes apical, the branches sometimes forked, or 2–3-flowered, the pedicels 3–6 mm. long; flowers 5-merous, roseate, sepals lanceolate, very acute, carinate, about 8 mm. long, 1 mm. wide; corolla 13 or 14 mm. long, narrow tube 1 cm. long, lobes lanceolate-linear, 1.5 mm. wide, subrounded apically.—Looks like *E. chilensis* Pers. as collected by Dombey, maybe in Chile, but according to the author it is strongly diverse in habit from both that species and *E. quitensis* by the large ovate-orbicular leaves, small flowers. F.M. Neg. 10269.

Lima: Lomas near barranca, (*Weberbauer 1647*, type).

Erythraea quitensis HBK. Nov. Gen. & Sp. 3: 178. 1819.

Stems about a dm. tall, equally foliose, strictly branched, the internodes about 2.5 cm. long, equaling the narrowly oblong obtuse leaves; cymes dichotomous, spreading, the flowers remote in floral leaves; tube of the 4-parted corolla one-fourth exceeding the calyx, the lobes elliptic-oblong, subobtuse; stigma subglobose or lightly lobate.—In photographs the narrow leaves are shorter than internodes. F.M. Negs. 10270; 37453.

Peru: Without locality, (*Mathews*). To Central America.

5. **COUTOUBEA** Aublet

Erect simple or branched herbs with opposite or verticillate sessile and white or purple sessile or subsessile flowers in terminal dense spikes or racemes. Calyx bibracteolate, deeply 5-parted, the lobes acuminate. Corolla with 4 spreading lobes, marcescent. Stamens 4, at throat or in the tube, the filaments ciliate at base, the erect anthers deeply cordate. Pollen tetrad, finely tuberculate in rows or indefinitely reticulate. Style slender, stigma 2-lobed.

Coutoubea spicata Aublet, Pl. Guian. 1: 72. 1775.

Stem strict or strictly branched, to 1 meter tall; leaves lanceolate, somewhat narrowed at sessile base, to about 1 dm. long or equaling the internodes; verticils of the dense terminal spikes contiguous.—Possibly the Peruvian specimens (not seen) rather are referable to *C. densiflora* Mart., similar, but leaves cordate at base. Illustrated, Pflanzenfam. 4, Abt. 2: 97, *fig. 44*.

Amazonas: Near Moyobamba, evergreen shrubs, (Weberbauer, 289).—San Martín: Rioja, *Weberbauer 4692.* Tarapoto, *Ule 6420.* To the Guianas.

6. **TACHIA** Aublet

Shrubs or slender trees with hollow stems and elongate lax or supported branches, opposite coriaceous leaves with 5 longitudinal nerves and solitary axillary sessile slender yellow-green 5-merous flowers. Calyx 5-carinate-alate. Corolla nearly cylindric, the slightly widened opened tube many times longer than lobes. Stamens inserted below middle of tube, filaments slender, anthers long-oval. Ovary 1-celled, stigma 2-lobed. Capsule long, the 2 placenta only slightly incurved marginally.—Pollen simple, exine obviously and regularly reticulate.

Tachia guianensis Aublet, Pl. Guian. 1: 75. 1775. *T. Pavonii* Gilg, Pflanzenfam. 4, Abt. 2: 93. 1895?

Slender stemmed shrub with sessile or subsessile ovate or subovate acuminate leaves 6 cm. long, about half as wide or larger, the very slender somewhat curved flowers to about 6 cm. long, "somewhat smaller" in the Peruvian species or form; calyx to 3 cm. long, the narrowly lanceolate lobes about half as long.—*T. Pavonii* is said by the author to differ from *T. guianensis* Aublet in the rather small flowers; doubtfully specifically distinct and essentially a nomen nudum. A 2-meter shrub, dense forest, flowers yellow. Illustrated, Gilg, l.c. *fig. 42, G* (*T. guianensis*).

Huánuco: Chicoplaya, *Ruiz & Pavón*, (type, *T. Pavonii*).—Loreto: Florida, mouth of Río Zubineta, *Klug 2123*. Forests of the Marañón, *Hopp 1128* (det. Herb. Dahlem). Brazil. "Eto sima-ey" (Klug, Huitoto).

7. LISIANTHUS L.

For convenience, the description of this group in the broadest sense is divided among the segregates *Chelonanthus, Macrocarpaea* and *Symbolanthus*, permitting those who regard them as distinct to determine the species supposed to belong to them; each is accompanied by a key to those species. Even within Peru there are species so exceptionally aberrant within this group that it does not seem possible that Gilg's definition soundly classifies them according to relationship. However, his key follows, as well as a general key to all the Peruvian species proposed, devised, in part, from descriptions, and merely expedient.

Actually, future investigation will probably show conclusively that one generic name expresses correctly the specific relationship of all these plants as suggested by Bentham, in Hook. Journ. Bot. & Kew Misc. 6: 200. 1854, and by F. P. Jonker, Meded. Bot. Mus. Rijksuniv. Utrecht 30: 251. 1936, who remarked that it seemed incorrect to separate a group on the basis of characters that are only visible with the help of chemicals and which lack parallel macroscopic features. Steyermark, Fieldiana 28: 496–497. 1953, discussed Gilg's treatment; he regards *Chelonanthus* as a part of *Lisianthus* and retains *Macrocarpaea* as distinct. In this connection one finds variation in pollen character, even in the same flower.

Pollen simple, exine clearly and very regularly and loosely reticulate.
  Stigma capitate or only weakly emarginate .... *Lisianthus.*
  Stigma deeply 2-lobed .... *Macrocarpaea.*
Pollen tetrad, the tetrads often joined; stigma 2-lobed.
  Exine very thick with irregular dissimilar tubercles . . *Chelonanthus.*
  Exine reticulate, the reticulation looser below ...... *Symbolanthus.*

GENERAL KEY TO LISIANTHUS, sens. lat.

Sections or genera *Chelonanthus, Macrocarpaea, Symbolanthus;* definitions of these and keys follow; most recently proposed species not transferred to *Lisianthus* because imperfectly known.

Flowers congested, more or less foliar bracted; upper leaves imbricate or in any case less than twice as long as wide, 3–6 cm. long.

Flowers tubular, 5–6 cm. long.....*M. chlorantha, L. loranthoides.*

Flowers subcampanulate, much shorter.

Leaves well imbricated, at least the upper..........*M. ovalis.*

Leaves subequaling or shorter than internodes..*M. stenophylla.*

Flowers rather laxly borne, upper leaves more or less reduced, all but the uppermost often longer than 6 cm. or often at least twice longer than wide.

Calyces shorter than 1 cm.

Leaves distinctly petioled, ample, acutely acuminate. *M. micrantha, M. revoluta.*

Leaves subsessile or pseudopetioled, more or less acute.

Leaves often about twice longer than wide, mostly subsessile unless lowest.

Stamens and style long-exserted...............*C. alatus.*

Stamens included.

Calyx lobes and tube subequal; style included. *C. uliginosus.*

Calyx lobes longer than tube; style exserted. *C. chelonoides.*

Leaves often much longer than wide, more or less petiole-attenuate.

Corollas much ampliate above the short tube. *C. leucanthus.*

Corollas gradually ampliate, the tube long, slender. *C. camporum.*

Calyces at least 1 cm. long, often much longer.

Calyces subbasally parted.

Leaves sessile, even the uppermost, small.

Leaves rotund-obovate, cordate at base.........*L. Baltae.*

Leaves oblong, obtuse at base..............*S. pauciflorus.*

Leaves at least shortly petioled, or ample.

Sepals acuminate; leaves to 3.5 cm. long...*S. microphyllus.*

Sepals rounded but sometimes apiculate or shortly acute.

Leaves 2.5–3 cm. wide or few wider, often more than twice as long.

Calyx about 1.5 cm. long; stamens as style well-exserted........*S. obscurerosaceus, L. Mathewsii.*

Calyx 2 cm. long; stamens as style barely exserted. *S. anomalus.*

Leaves usually about 5 cm. wide or ordinarily about half as wide as long.

Corollas gradually ampliate, to about 2 cm. wide at throat or slender.

Corollas to about 7 cm. long, ampliate above.

Calyces angled; leaves acuminate...*C. calygonus.*

Calyces ovoid; leaves acute........*S. daturoides.*

Corollas 3–3.5 cm. long, slender.......*M. guttifera.*

Corollas broadly ampliate at throat, there wider than 2 cm..........................*L. Rusbyanus.*

Calyces at most medially parted.

Branches subterete to tetragonous-sulcate.

Inflorescence early viscous-puberulent; capsules spindle-shaped, 3–5 cm. long, about 8 mm. thick at base. *M. viscosa.*

Inflorescence glabrous; capsules ovoid-ellipsoid, about 1.5 cm. thick medially (known).

Calyces 10–11 mm. long; corollas 3–4 cm. long, dilated at throat.........................*M. corymbosa.*

Calyces 1.5–2 cm. long; corollas 4–5.5 cm. long. *M. pachystyla.*

Branches 4-alate..............................*C. alatus.*

CHELONANTHUS (Griseb.) Gilg

Annuals or more enduring with few-veined leaves and flowers in terminal loose cymes that are often irregular. Exine of tetrad pollen more or less unevenly tuberculate. Ovary nearly 2-celled. Fruit rather ellipsoid.—Otherwise much like *Symbolanthus* in which apparently it could be included; the group was not recognized by Malme, at least in 1927. The key is entirely artificial, in part after descriptions; the unknown *Lisianthus loranthoides*, perhaps ex char. referable here, is omitted here; see under *Macrocarpaea.*

Leaves often about half as wide as long, mostly subsessile unless the lowest.

Stamens and style long-exserted . . . . *C. alatus.*

Stamens included.

Calyx lobes and tube subequal; style included . . . . *C. uliginosus.*

Calyx lobes longer than tube; style exserted . . . . . *C. chelonoides.*

Leaves more or less attenuate to petiole-like base, often much longer than wide.

Corollas much ampliate above the short tube . . . . . . *C. leucanthus.*

Corollas gradually ampliate above the long slender tube. *C. camporum.*

SYMBOLANTHUS Don

Leiothamnus Griseb. Gent. 205. 1838.

Shrubs with pinnate leaves and 1–3 rarely several large 5-merous flowers at tip of branchlets. Calyx campanulate, parted nearly to base. Corolla with broad cylindric tube, obtuse or acute, lobes mostly spreading at anthesis, the stamens inserted in the tube and often accompanied by processes. Anthers recurving in age, the pollen tetrad, exine reticulate, almost porelike on upper side. Ovary 1-celled, stigma 2-lobed; capsule elongate with many small seeds.

Leaves sessile, even the uppermost, small.

Leaves rotund-obovate, cordate at base . . . . *S. Baltae.*

Leaves oblong, obtuse at base . . . . *S. pauciflorus.*

Leaves at least shortly petioled, or ample.

Sepals acuminate; leaves to 3.5 cm. long . . . . *S. microphyllus.*

Sepals rounded, sometimes apiculate or shortly acute.

Leaves 2–3.5 cm. wide or a few wider, often more than twice as long.

Calyx about 1.5 cm. long; stamens as style well-exserted. *S. obscurerosaceus, S. Mathewsii.*

Calyx 2 cm. long; stamens as style barely exserted. *S. anomalus.*

Leaves usually about 5 cm. wide or ordinarily about half as wide as long.

Corolla gradually ampliate, to about 2 cm. wide at throat. *S. daturoides, S. calygonus.*

Corolla broadly ampliate at throat, there wider than 2 cm. *S. Rusbyanus.*

MACROCARPAEA (Griseb.) Gilg

Reference: Joseph Ewan, Contr. U. S. Nat. Herb. 29: 209–250. 1948.

In Peru, tall stately shrubs with ample pinnate-nerved leaves and large 5-merous flowers in terminal cymes. Calyx short, the broad rounded lobes subequal. Corolla more or less campanulate above the short or long tube, the rounded lobes short. Stamens inserted in the throat below; anthers without connective. Style slender, stigma bilobed. Capsule short to elongate-ellipsoid, subligneous to cartilaginous or chartaceous, quite free from the ligneous cupulate calyx, dehiscing longitudinally into 2 more or less regular valves or carpels, each with partial partition between the strongly incurved edges. Seeds many, sharply angled, less than 2 mm. long.—Pollen of *Tachia* and *Lisianthus* and could be included in the latter, being apparently arbitrarily segregated in the rounded calyx lobes, parted stigma—trite characters in the family—but perhaps it is conveniently designated as a group; two species even in Peru, however, are so distinctive that there doesn't seem to be natural homogeneity.

MACROCARPAEA KEY (after Ewan)

Floral leaves coriaceous, lower shorter than 1.5 dm.; internodes often short, grooved, vertebra-like.
  Flowers not foliately bracted.
    Leaves narrowly lanceolate .... *M. revoluta.*
    Leaves oblong-ovate to suborbicular, obtuse or acute.
      Corolla tubular, 5–6 cm. long, 5–6 mm. wide. *M. chlorantha, L. loranthoides.*
      Corolla subcampanulate, less than 4.5 cm. long, about 1 cm. wide .... *M. ovalis.*
  Flowers foliately bibracteate .... *M. stenophylla.*
Floral leaves membranous or merely firm, lower usually 1.5–3 dm. long; internodes smooth or simply quadrangular.
  Calyx subbasally parted, glandular-dotted as corolla and leaves. *M. guttifera.*
  Calyx less than one-third parted, if glandular also puberulent.
    Leaves lanceolate-elliptic, petioles to 3 cm. long or longer. *M. micrantha.*
    Leaves oval or ovate, petioles to 2 cm. long or shorter.

Calyx lobes suborbicular, broadly imbricate; corolla lobes much crisped........................*M. corymbosa.*

Calyx lobes truncate-rounded if imbricate, the calyx basally rounded; corolla lobes plane or nearly plane.

Calyx cupulate, the acute lobes hyaline to base. *M. pachystyla.*

Calyx suboblong, the obtuse lobes hyaline above. *M. viscosa.*

MACROCARPAEA (Supplementary Key)

Flowers congested, more or less foliar bracted; upper leaves imbricate or in any case usually less than twice as long as wide, 3–6 cm. long.

Flowers tubular, 5–6 cm. long.....*M. chlorantha, L. loranthoides.*

Flowers subcampanulate, much shorter.

Leaves well-imbricated, at least the upper..........*M. ovalis.*

Leaves subequaling or shorter than internodes..*M. stenophylla.*

Flowers rather laxly borne, upper leaves reduced, all but the uppermost longer than 6 cm. or at least twice longer than wide.

Calyces shorter than 1 cm............*M. micrantha, M. revoluta.*

Calyces at least 1 cm. long.

Calyces subbasally parted; flowers slender, 3–3.5 cm. long. *M. guttifera.*

Calyces at most medially parted; flowers subcampanulate to turbinate.

Inflorescence early viscous-puberulent; capsules spindle-shaped, 3–5 cm. long, about 8 mm. thick at base......*M. viscosa.*

Inflorescence glabrous; capsules ovoid-ellipsoid, about 1.5 cm. thick medially (known).

Calyces 10–11 mm. long; corollas 3–4 cm. long, dilated at throat............................*M. corymbosa.*

Calyces 1.5–2 cm. long; corollas 4–5.5 cm. long. *M. pachystyla.*

Lisianthus alatus Aublet, Pl. Guian. 1: 204, *pl. 80.* 1775. *Chelonanthus alatus* (Aublet) Pulle, Enum. Vasc. Pl. Surin. 376. 1906. *C. acutangulus* (R. & P.) Gilg, Pflanzenfam. 4, Abt. 2: 98. 1895. *L. acutangulus* R. & P. Fl. Peruv. 2: 14, *pl. 122, fig. a.* 1799.

Stem simple, 4-alate, to a meter tall, the internodes 7 cm. long to twice as long above; leaves subsessile, broadly ovate-elliptic, acute, 1 dm. long, 3–5 cm. wide; cymes dichotomous, branches 1–few-flowered; calyx globose, lobes ovate, equaling the incurved-gibbous tube of corolla, the latter 2.5 cm. long, the greenish subrotund lobes much shorter than incurved tube, spotted; stamens and style long-exserted, the latter persisting on the 2-celled oblong capsule.—The Peruvian plant with broader leaves may be distinct. Flowers yellowish-green. F.M. Neg. 29536 (*C. acutangulus*).

Cajamarca: Near Socota, 3,200 meters, *Stork & Horton 10118* (det. Standley).—San Martín: San Roque, *Williams 7171*.—Huánuco: Among shrubs, near Monzón, *Weberbauer 3504* (det. Gilg). Panatahuarum at Chinchao, *Ruiz & Pavón*, type. Puente Durand, *Stork & Horton 9442; 9570*. Río Santo Domingo, *3700*. Pozuzo, *4674*.—Junín: Colonia Perené, *Killip & Smith 24972*. Puerto Yessup, *Killip & Smith 26288*. Satipo, *Soukup 2859*. Chanchamayo Valley, *Schunke 533; 1523; Killip & Smith 23872*.—Loreto: Río Nanay, *Williams 713; 748; 1222*. Iquitos, *Williams 1459; 1534; 7948*.—Ayacucho: Aína, *Killip & Smith 22534*.—Cuzco: Santa Ana, *Weberbauer 5006*. Prov. Urubamba, *Vargas 2671*. Tambamayo, Prov. Paucartambo, *West 7129* (det. Johnston); *Vargas 49*. Prov. Convençion, *Vargas 2567*.—Puno: Pajonal Trail, Prov. Sandía, *Metcalf 30616* (det. Leonard). Bolivia to the Guianas.

Lisianthus anomalus HBK. Nov. Gen. & Sp. 3: 184. 1819. *Symbolanthus anomalus* (HBK.) Gilg, Pflanzenfam. 4, Abt. 2: 99. 1895. *Leiothamnus anomalus* (HBK.) Griseb. Gent. 205. 1838.

Shrub with green-barked opposite branches, internodes to about 2.5 cm. long, petioles vaginate, 6–8 mm. long; leaves herbaceous, spreading, lustrous, ovate, rarely oblong-elliptic, subobtuse, pinnate-nerved, 2.5–5 cm. long, 2.5 cm. wide; flowers roseate, axillary peduncles about 2.5 cm. long; calyx oblong, 18 mm. long, 12 mm. broad, the lobes imbricate, basally scarious-margined; corolla 3–5 cm. long, hypocrateriform, broadly cylindric tube 8 mm. wide, cyathiform at apex, the elliptic lobes 18 mm. long, 12 mm. wide; stamens exserted, inserted in tube, the filaments membranously annulate, anthers erect, not at all apiculate; stigma lobes oblong-obovate.—Differs from *L. loranthoides* in cylindric tube, lobes imbricate (Grisebach). Seemingly here is the Woytkowski shrub, the rich vermilion flowers dark purple, white-striped and -lined within, sometimes found in large groups (collector). F.M. Neg. 10231.

Amazonas: Ventilla, (*Mathews*, fide Grisebach).—Huánuco: Torre-Hausi, *Woytkowski 34278* (distr. as *S. Mathewsii*).

Lisianthus Baltae (Weberb. & Gilg) Macbr. comb. nov. *Symbolanthus Baltae* Weberb. & Gilg, Repert. Nov. Sp. 2: 56. 1906.

Shrub 2 meters high with acutely tetragonous or subtetrapterous branches, the internodes 3–5 cm. long, leaves obovate, rounded at apex but apex itself acutely acuminate, cordate at the sessile base, 6–7.5 cm. long, 3.5–5 cm. wide, subcoriaceous nerves scarcely conspicuous either side; flowers yellowish-green in lax 2–3-flowered cymes, the pedicels 3–5 cm. long; calyx narrowly campanulate, 13 or 14 mm. long, the ovate-orbicular sepals free; corolla 5.5–6.5 cm. long, dilated above the narrow base, about 2 cm. wide at throat, the broadly ovate very acute lobes 13 or 14 mm. long, nearly as wide, the stamens included.—Species affine *S. pauciflorus* Gilg and *S. Stuebelii* Gilg (authors). F.M. Neg. 10232.

Amazonas: In shrub, Moyobamba, 1,300 meters, *Weberbauer 4737*, type.

Symbolanthus Brittonianus Gilg, Bot. Jahrb. 22: 342. 1896.

Glabrous, the branches tetragonous; petioles 2–6 mm. long, the upper obsolete, joined basally by an elevated line; leaves oblong-lanceolate, gradually narrowed into petioles, acutely acuminate or subacuminate, 8–12 cm. long, 3–5 cm. wide, the 4–6 pairs of nerves all equally arcuate to margin as veins little prominent either side; flowers 1–4 at tip of stems and branches, pedicels 2–2.5 cm. long; sepals ovate, nearly free, subcoriaceous, subrotund, 17–18 mm. long, about 8 mm. wide; corolla tube slender-cylindric, not or scarcely ampliate above, about 4 cm. long, 16 mm. across below throat, the basally ovate lobes apiculate, nearly three-fifths as long as tube; stamens as long as tube or longer, inserted in lower and fourth, connate at base in a membrane 12–13 mm. high; style exserted, broadly lobed.—Widely separated from *S. calygonus* (R. & P.) Gilg (author), the type from Bolivia.

Puno: Sandía, Pajonal Trail, *Metcalf 30614* (det. Killip). Bolivia.

Lisianthus calygonus R. & P. Fl. Peruv. 2: 14, *pl. 126*. 1799. *Symbolanthus calygonus* (R. & P.) Griseb. ex Gilg, Bot. Jahrb. 22: 341. 1896. *Tachia calygona* (R. & P.) Griseb. Gent. 204. 1838. *S. Pavonii* G. Don, Gen. Syst. 4: 210. 1838.

Suffrutescent, the stems and branches obtusely tetragonous; petioles about 6 mm. long; leaves ovate, acuminate, to about 1 dm. long, half as wide; peduncles 2.5 cm. long, one or two in the upper axils and terminal; flowers about 7 cm. long; calyx 5-angled, 3 outer lobes lanceolate, interior subsagittate, all membranous-fimbriate-margined; corolla tube obovate from the broad base, about 8 mm. wide at apex, the lobes 2.5 cm. long, cordate-sagittate, acuminate, reflexed; anthers cordate-sagittate; dentiform scales at base between filaments; capsule ovate, finally 5 cm. long, half as thick, the valves slightly introflexed.—Shrub half a meter to a meter high; corolla orange-yellow, fruit rose-red (Stork & Horton) or flowers obscurely roseate. Gilg indicated the transfer from *Lisianthus* in Pflanzenfam. 4, Abt. 2: 99. 1895 without naming place of publication. F.M. Neg. 10233.

Cajamarca: Socota, Cutervo Prov., *Stork & Horton 10124* (det. Standley). Cutervo, *Raimondi.*—Huánuco: Near Monzón, 2,400 meters, *Weberbauer 3414; 3536* (det. Gilg). Río Chinchao, *5168.* Acomayo, Muña, Pillao, Chinchao, *Ruíz & Pavón,* type. Playapampa, *4482.*—Loreto: Cerro de Escalero, *Ule 6566.*

Chelonanthus camporum Gilg, Repert. Nov. Sp. 2: 54. 1906.

Perennial herb with strict unbranched terete or subterete stem, the opposite leaves 1.5–2.5 cm. distant below, 7–10 cm. distant toward the terminal 2–4-flowered cymes; leaves lanceolate or oblong-lanceolate, acute, particularly narrowed to base, 2.5–3.5 cm. long, 5–10 mm. wide, membranous, somewhat 3-nerved; pedicels 5–8 mm. long, bracts none or minute; calyx short-cupulate, lobes nearly free, broadly oblong, rounded, 6–7 mm. long, about 4 mm. wide, chartaceous; corolla zygomorphic, the curved narrowly obconic tube about 4 cm. long, much narrowed below, gradually ampliate, to 6 mm. thick, the unequal obliquely ovate lobes more or less acute, 4–5 mm. long, 3–4 mm. wide; anthers extrorse.—Affine *C. angustifolius* (HBK.) Gilg (author) and not clearly distinct. F.M. Neg. 10228.

Cajamarca: Tabaconas, *Weberbauer 6252.*—Amazonas: Open grass-shrub areas, 900 meters, Moyobamba, *Weberbauer 4546,* type. Cerro Morro de Moyobamba, 1400 meters, *Stuebel 62a.* Near Moyobamba, *Woytkowski 35290; 35333* (det. Cuatrecasas).—San Martín: San Roque, *Williams 7665.* Zepelacio, *Klug 3364.* Tarapoto, *Spruce 4358.*

Lisianthus chelonoides L. f. Suppl. 134. 1781. *Chelonanthus chelonoides* (L.) Gilg, Pflanzenfam. 4, Abt. 2: 98. 1895.

A meter tall or taller, the unbranched stem subtetragonous below where internodes about 5 cm. long, the uppermost to 12 cm. long; leaves elliptic, the lower attenuate into petiole, the upper sessile, ovate, mostly 5–10 cm. long, half as wide; cyme dichotomous, flowers secund on branches 5–10 cm. long, petioles 4 mm. long; calyx turbinate, 6 mm. long, obtuse lobes longer than tube; corolla about 2.5 cm. long, tube slender, throat infundibuliform-gibbous, oblong lobes obtuse; stamens included; stigma bilamellate, exserted; capsule twice as long as calyx, 2-celled.—Used for worm-infested wounds in stock.

Huánuco: Trail above Chinchao, *Mexia 04153* (det. Johnston). Without locality, (*Mathews*, fide Grisebach). To Trinidad. "Tres esquinas."

Macrocarpaea chlorantha Gilg, Repert. Nov. Sp. 2: 53. 1906; 235.

Branches acutely tetragonous, internodes only 1–2.5 cm. long; leaves oval or oval-oblong, subrounded or subacute, narrowed into petiole 7–8 mm. long, more or less coriaceous, nerves and veins not a little prominent, often 4–5.5 cm. long, 12–16 mm. wide, flowers at apex of stems and branches in many-flowered cymes, the pedicels 3–10 mm. long; calyx tubular campanulate, 10–12 mm. long, the suborbicular rounded lobes scarcely equaling the tube; corolla long-cylindric, 4.5–4.7 cm. long, tube narrowed below, little enlarged above the base, about 7 mm. thick, the suborbicular lobes about a fourth to a fifth as long as tube; stamens extrorse.—Affine *M. stenophylla* Gilg (author), type 1 meter high, flowers pale green. Unique in the genus is its long-cylindric corollas (Ewan). F.M. Neg. 26828.

Almost certainly *Lisianthus loranthoides* Griseb., further indication that there is only one genus.

Amazonas: Near Ventillas, toward Chachapoyas, grass-shrub formation, 3,300 meters, *Weberbauer 4411*, type.

Lisianthus corymbosus R. & P. Fl. Peruv. 2: 14, *pl. 124*. 1799. *Macrocarpaea corymbosa* (R. & P.) Ewan, Contr. U. S. Nat. Hist. 29: 242. 1948. *M. glabra* (L. f.) Gilg, as to Peru fide Ewan.

Slender glabrous shrub, to 4 meters tall, the lightly grooved or subterete branchlets with long internodes; petioles to 2.5 cm. long; leaves lanceolate (subsessile, upper subrotund), acute both ends, to 2 dm. long, 9 cm. wide, to about half as long or the floral more reduced, all thin-membranous; panicles ample, leafy-bracted, branching below with long-pedunculate 5–7-flowered cymules, the terminal portion open; calyx short-campanulate, acute at base, 10 or 11 mm.

long, the orbicular conspicuously imbricate lobes hyaline-margined, finely crisped; corolla greenish-yellow, to about 1.5 mm. wide below the crisped lobes, 5 mm. wide near base, the narrowly campanulate tube 3–4.2 cm. long; capsules narrowly oblong-ovoid, to 4.5 cm. long, nearly 2 cm. thick, mucronate, muriculate; seeds about 1 mm. long including the irregularly lacerate wing.

Huánuco: Acomayo and Chinchao, *Ruíz & Pavón*, type.—Cuzco: Lares Valley, *Weberbauer 7921* (det. Ewan).

Lisianthus daturoides Griseb. Gent. 177. 1839. *Symbolanthus daturoides* (Griseb.) Gilg, Pflanzenfam. 4, Abt. 2: 99. 1895.

Simple, fistulose tetragonous sulcate stemmed, branched only in the inflorescence; internodes 2.5 cm. long, petioles short, articulate at the broad base; leaves elliptic, 1–1.2 dm. long, to 5 dm. wide, acute both ends, sparsely venose, paler beneath; cymes 3–4-flowered, the peduncles to 5 cm. long, stout, hirsute-viscous, dilated above; calyx ovoid, broader than long, viscous, equal lobes imbricate, ovate, acute; corolla 7 cm. long, the tube gradually enlarged, lobes 16–20 mm. long and wide, ovate, cuspidate; stigma lobes rounded-oblong.—Near *L. viscosus* but seems to recede in its acute calyx lobes, sparsely veiny leaves and larger corolla; the viscosity is conspicuous also in the calyx (author).

Amazonas: Near Sambrasbamba, (*Mathews 1317*, type, Herb. Hooker).

Macrocarpaea guttifera Ewan, Contr. U. S. Nat. Herb. 29: 237. 1948.

Type a slender shrub 2–3 meters tall, the glabrous ligneous branchlets fissured below, subterete above; petioles stout; leaves lanceolate or the uppermost ovate, acuminate, often 1.5–2 dm. long, 6.5–9 cm. wide, thick-coriaceous, lustrous, finely punctate both sides with golden glands and prominently venulose; panicle stoutly long-peduncled, nearly bractless, narrow and rather compact, the lax 3-flowered cymules few; calyx cupulate, 11–18 mm. long, nearly basally divided with strongly imbricate broadly oblong or suborbicular lobes, these, except the hyaline margins, papillate with sessile glands; corolla green, slender-campanulate, 3–3.5 cm. long, densely papillate glandular except proximal portion of the tube, the thick oblong acute lobes 6–7 mm. long; anthers white.—Systematic position cannot be suggested from its several unusual characters (Ewan).

Loreto: Near Iquitos, (*Killip & Smith 27045*, type).

Chelonanthus leucanthus Gilg, Repert. Nov. Sp. 2: 55. 1906.

More or less ligneous below, sometimes a meter high, the stems apparently unequally angled above; leaves opposite, the lower 1–3 cm., the upper 1–2 dm. distant, all oblong, acute, gradually pseudopetiolate, membranous, 5–9 cm. long, 1.5–3 cm. wide, the 2 pairs of prominent lateral nerves acutely angled, finally subparallel, the fine and few veins obsolete; flowers whitish, in terminal forked cymes, the branches to 2 dm. long, pedicels 4 or 5 mm. long, bracts none; calyx short-cupulate, the nearly free broadly ovate rounded chartaceous lobes about 7 mm. long, almost as wide; corolla clearly zygomorphic, the somewhat curved tube narrowed below, much ampliate above, 2–2.5 cm. long, 10–14 mm. across at throat, the very unequal rounded lobes about 1 cm. long and wide; stamens included.—Affine *C. bifidus* (HBK.) Gilg (author). F.M. Neg. 10230.

Puno: Between Sandía and Chunchusmayo, *Weberbauer 1094*, type.

Lisianthus loranthoides Griseb. Gent. 179. 1838.

Shrubby, the stem tetragonous, sulcate, striate with alternate erect-spreading branches; internodes enlarged, 8–12 mm. long; petioles stout, 4–6 mm. long; leaves oval, obtuse both ends, about 3.5 cm. long, 2 cm. wide, coriaceous, lustrous above, revolute, articulate; cymes 6–10-flowered, pedicels 4–8 mm. long; calyx elliptic-oblong, 1 cm. long, 4 mm. broad, lobes oblong, obtuse, margins scarious; corolla 5 cm. long, tube cylindric, arcuate-gibbous, lobes ovate, obtuse; stamens little, style well exserted; anthers stout, sagittate, connective not produced; capsule 2-celled, erect, style persisting; corolla deciduous.—Ex char. may be *Macrocarpaea chlorantha* Gilg.

Amazonas: Chachapoyas, (*Mathews 1315*, type); *Williams 7586*.

Lisianthus Mathewsii Griseb. Gent. 361. 1838.

Shrub, branched above with short leafy branches, the tetragonous sulcate stem glabrous; internodes to 2.5 cm. long; petioles 6 mm. long; leaves ovate- or elliptic-oblong, acute each end, less so at base, to 5 cm. long, 22–26 mm. wide, subcoriaceous, obscurely venose, little paler beneath; peduncle terminal, 2.5 cm. long, nutant; calyx 12 mm. long, subglobose, ample, the lobes imbricate; corolla 5 cm. long, purplish, tube 4 mm. long, gradually enlarged, subventricose at apex the expanded triangular lobes subacute, about 5 mm. long and wide; stamens subequal, exserted; stigma lobes oblong.—Differs from *L. daturoides* especially in calyx which is four times shorter than corolla tube with very broad scarious-margined lobes, solitary flower and much smaller leaves (author).

Amazonas: Chachapoyas, (*Mathews* in 1836, type, Herb. Hooker).

Macrocarpaea micrantha Gilg, Bot. Jahrb. 22: 338. 1896; 240. *M. Weberbaueri* Gilg, Repert. Nov. Sp. 2: 54. 1906, fide Ewan.

Elongate branches obscurely 4-angled above; lower leaves 3–4, upper to 14 cm. distant, all opposite, membranous, oblong, gradually narrowed into petioles 2–3 cm. long, narrowly and acutely acuminate, 9–14 cm. long, 4–6.5 cm. wide, the 3–4 pairs of lateral nerves acutely angled, the uppermost pair 3–5 mm. from the margin even to the apex, the few veins laxly reticulate; flowers in apical much-divided cymes, pedicels 15–18 mm. long, basal bracts none or small; calyx campanulate, coriaceous, 7–8 mm. long, the broadly ovate rounded lobes about a third as long as the tube; corolla tube obconic, 16 or 17 mm. long, much narrowed below, strongly ampliate above, 8 or 9 mm. across below the throat, the lobes about 7 mm. long, 5 mm. wide, ovate-rounded; stamens exserted; fruit conical, 3–3.5 cm. long, to 6 mm. thick below, with enlarged style.—Type 4 meters high, the flowers greenish-yellow. Affine *M. revoluta* (R. & P.) Gilg (author), and it seems to me doubtfully at most a part of that species. F.M. Negs. 22741; 26829.

Amazonas: Near Moyobamba, 1,000 meters, *Weberbauer 4655* (type, *M. Weberbaueri*).—San Martín: Tarapoto, *Spruce 4618*, type. —Cuzco: Hacienda Idma, Prov. Convençion, 1,500 meters, (*Weberbauer 5006*, det. Ewan).

Symbolanthus microphyllus Gilg, Repert. Nov. Sp. 2: 55. 1906.

Small bush 2–3 dm. high, the roots slender, elongate; stem solitary or branched at base, the simple branches often forked above, all acutely 4-angled; leaves densely approximate, 3–15 mm. distant, rhomboid-oblong, acute or acutely acuminate, narrowed to petiole 1–2 mm. long, coriaceous, 2–3.5 cm. long, 10–16 mm. wide; flowers usually solitary at tip of stem and branches, rarely binate, leafy-bracted, the pedicels about 1.5 cm. long; sepals free, coriaceous, ovate, acuminate, carinate, 16–21 mm. long, 1–1.5 cm. wide; tube of the corolla subcylindric, obviously dilated above, 4–5 cm. long, 6–8 mm. thick, the lobes ovate, about 2 cm. long, 1.5 cm. wide, acutely acuminate, spreading at anthesis; stamens and style exserted from throat.—Affine *S. pauciflorus* Gilg (author). F.M. Neg. 10236.

Puno: At edge of shrubs, Sandía to Chunchusmayo, *Weberbauer 1093*, type.

Symbolanthus obscurerosaceus Gilg, Repert. Nov. Sp. 2: 56. 1906.

Branches acutely tetragonous, the internodes 2.5–4 cm. long; leaves oblong or oblong-lanceolate, acute or acutely acuminate, cuneately narrowed to petiole 7–9 mm. long, subchartaceous, nerves and veins little conspicuous, 5.5–7.5 cm. long, 2–3.3 cm. wide; flowers obscurely roseate, the throat violet, binate or often solitary at tip of branches, the pedicels 2–2.5 cm. long; calyx about 1.5 cm. long, the sepals rounded, nearly free; corolla before anthesis 5.5–6 cm. long, the subcylindric tube 4 cm. long, little dilated above, about 7 mm. thick at throat, the spreading or reflexed lobes ovate, acute or apiculate, 2–2.3 cm. long, 16–18 mm. wide; stamens and style about 1.5 cm. longer than corolla throat.—Type from a 3-meter shrub; species affine *S. anomalus* (HBK.) Gilg (author). F.M. Neg. 10237.

Amazonas: In shrubby fields, 1,000 meters, near Moyobamba, *Weberbauer 4634*, type.

Lisianthus ovalis R. & P. Fl. Peruv. 2: 13. 1799. *Macrocarpaea ovalis* (R. & P.) Ewan, Contr. U. S. Nat. Herb. 29: 234. 1948.

Slender shrub or small rather densely crowned tree, 2–3 meters high, the glabrous terete (or grooved above) branchlets with short internodes; petioles 3–5 mm. long; leaves oval, obovate or short oblong-ovate, rounded or slightly narrowed basally, 5–6 cm. long, 3–4 cm. wide, subcartilaginous-margined, lustrous above, faintly glandular-punctate beneath, obscurely venose both sides; panicle compact, leafy, lateral branches short, 5–8-flowered, cymules few; flowers greenish-yellow, the oblong campanulate calyx 8–10 mm. long, obtuse at base, the rounded hyaline-margined lobes medially tawny puberulent, alternate imbricate; corolla narrowly campanulate, tube flaring but little above calyx, 3.5–4 cm. long, the ovate acute finely erose lobes about 1 cm. long.—There may have been a mistake in the label on the original specimen, apparently from Ecuador. Grisebach (Gent. 178. 1838) included here *Mathews 1314* from Jamhasbamba, Amazonas, which from his description is scarcely the same. F.M. Neg. 29363.

Huánuco: Chinchao, *Ruíz & Pavón*, type. To Colombia.

Macrocarpaea pachystyla Gilg, Bot. Jahrb. 22: 336. 1896; 245.

Arborescent, glabrous, the stout branchlets terete but faintly striate above; petioles 2 cm. long, canaliculate; leaves thin-membranous, paler and glaucous beneath, the secondary veins prominent, the principal ones broadly ovate, acute, the upper floral oblong-ovate or suborbicular, abruptly narrowed to a connate clasping base; panicle lax, leafy-bracteate, the 3–5 cymules few-flowered, the pedicels stout; calyx broad at base, campanulate or goblet-shaped, 1.5–2 cm. long, 8–14 mm. broad, the imbricate broadly ovate lobes scarious- and erosulate-margined; corolla yellow-green, turbinate-campanulate, 4 (–5.5, Gilg) cm. long, flaring below the ovate-subrotund lobes; capsules shortly flask-shaped, tapering to stout style.—The Woytkowski plant 4 meters tall, with thin velvety glossy leaves, the veins thick (collector); corolla tube 1.5 cm. wide near base, 2 cm. wide at throat. F.M. Neg. 29361.

Huánuco: Chicoplaya, *Ruiz & Pavón,* type.—Junín: Agua Dulce, Prov. Tarma, *Woytkowski 35417* (det. Cuatrecasas).—Puno: Sagrario, Prov. Sandía, (*Metcalf 30629*).

Lisianthus pauciflorus Spruce, in herb. *Symbolanthus pauciflorus* [Spruce] Gilg, Bot. Jahrb. 22: 340. 1896.

Glabrous, the branches acutely tetragonous; leaves opposite, united at obtuse sessile base by an elevated line, oblong, acutely acuminate, 4–5 cm. long, to 2 cm. wide, nerves and veins little prominent, coriaceous; flowers 1 or 2 on pedicels near or at branchlet tip, pedicels 2–2.5 cm. long; sepals free or nearly, coriaceous, subacute, 13 or 14 mm. long, 7–8 mm. wide; corolla tube subcylindric, little ampliate to 12 mm. wide above, about 4 cm. long, the broadly ovate lobes very acute, about a third as long; style exserted as sometimes stamens.—Differs from *S. Stuebelii* Gilg of Colombia in leaves and flowers (author). F.M. Neg. 10238.

Loreto: Near Yurimaguas, *Spruce 4429,* type. Canelu Ucshu, *Ule 6871.*

Lisianthus revolutus R. & P. Fl. Peruv. 2: 14, *pl. 127.* 1799. *Macrocarpaea revoluta* (R. & P.) Gilg, Pflanzenfam. 4, Abt. 2: 94. 1895; 230.

Slender open shrub or small tree to 5 meters high, the few spreading branches weakly angled below, subterete above; petioles short, stout; leaves lanceolate or the upper oblong-elliptic, acute at base, acuminate, usually 10–14 cm. long, 4–5.5 cm. wide, thick or subcoriaceous, revolute by a narrow almost cartilaginous border, glabrous above, early crisp-hirtellous on the veins beneath; panicles open, diffusely branched, the rather crowded many-flowered cymules at the ends of elongated branchlets; flowers waxy cream-colored, pedicels pruinose-puberulent; calyx short-campanulate, 6–9 mm. long, the short (2–2.5 mm. long) lobes little imbricate, often flaring; corolla rather abruptly ventricose, 3–3.5 cm. long, the triangular oblong obtuse or acute lobes about 1 cm. long; capsules lance-tapering, to 3.8 cm. long, often abruptly acute to short style; seeds somewhat quadrate, 0.5–0.8 mm. long, lacerately alate, golden-brown, the body alveolate.—Illustrated, Ewan, l.c. *pl. 4*, opp. p. 223. F.M. Neg. 26838.

Amazonas: Chachapoyas to Moyobamba, *Williams 7596* (det. Gilg).—Huánuco: Saria near Muña, *Ruiz & Pavón*, type.—Junín: Huacapistana, 2,600 meters, *Weberbauer 2191* (det. Gilg).

Lisianthus Rusbyanus (Gilg) Macbr., comb. nov. *Symbolanthus Rusbyanus* Gilg, Bot. Jahrb. 22: 344. 1896.

Glabrous, the branches acutely angled, leaves oval or oval-oblong, attenuate to the subsessile or sessile base where lineately united, acutely subacuminate, 7–13 cm. long, 4–7.5 cm. wide, membranous, the 2 lower of the 5–7 nerves stronger, subparallel to margin, veins obscure; flowers apical, about 3-fasciculate, pedicels 2.5 cm. long; sepals free, coriaceous, rounded, to 2.5 cm. long, 12 or 13 mm. wide; corolla tube subcylindric, gradually ampliate above, about 4.5 cm. long, 22–24 mm. wide at throat, orbicular-ovate acutely apiculate lobes reflexing, half as long; basal staminal scales ovate, subobtuse, 7–8 mm. long, 3–4 mm. wide; style exserted, stigma bilobed.—Distinctive by the form of the leaves and singular corolla scales; nearest *S. magnificus* Gilg, of Venezuela, differing in shape and size of flowers (author). Corolla tube glossy dark red, throat orchid-red, white-striped (Stork & Horton). A 1- to 4-meter shrub with rose-colored or whitish-green flowers (*Weberbauer*); yellowish-green (*Pennell*) or yellow with red stripes (*Raimondi*); this last collection in herbarium Dahlem is the type of an unpublished name. F.M. Neg. 10242; 10240.

Amazonas: Pomacochas to Yambrasbamba, 2,300 meters, *Weberbauer 7149* (det. Reimers). Valle de Huayabamba, Prov. Chachapoyas, *Raimondi 1766*. Chachapoyas, *Williams 7604* (det. Gilg).—Huánuco: Carpish, *Goodspeed Exped. 9914* (distr. as n. sp. after Exped. Director).—Ayacucho: Choimacota Valley, *Weberbauer 7556*.—Cuzco: Pillahuata, *Pennell 13980*. Bolivia.

Macrocarpaea stenophylla Gilg, Bot. Jahrb. 22: 337. 1896; 220.

Known as a small shrub 1 meter high, the glabrous quadrangular branchlets with internodes 3.5–6 cm. long but often longer than the leaves; petioles 2–3 mm. long; leaves ovate-oblong, obtuse or shortly acute both ends, 2.8–3.8 (–5.5, Gilg) cm. long, 12–18 mm. wide, coriaceous, slightly revolute, nearly or quite glabrous, sparsely punctate-dotted beneath; panicles congested, the light-green flowers borne in short-pedunculate leafy-bracted cymules, the two bracts spatulate-obovate, 10–16 mm. long; calyx short-campanulate, 6–9 mm. long, the low rounded lobes hyaline-margined; corolla turbinate-campanulate, 3.2–3.5 cm. long, the ovate to suborbicular lobes 7–10 mm. long.

Amazonas: Mojon Cruz, Ventilla to Bagazán, (*Stuebel 24c*, type). La Jalca, Chachapoyas to Moyobamba, *Williams 7582* (det. Gilg).

Lisianthus uliginosus Griseb. Gent. 181. 1838. *Chelonanthus uliginosus* (Griseb.) Gilg, Pflanzenfam. 4, Abt. 2: 98. 1895.

Root fibrous with a solitary tetragonous stem several dm. tall and a few short densely leafy sterile shoots; lower internodes mostly 1.5–3 cm. long, the longer upper finally to 3 dm. long; leaves variable in shape, cordate to elliptic-lanceolate, obtuse to acuminate, upper oblong ovate, usually 2.5–5 cm. long, 12–25 mm. wide, cymes mostly dichotomous, the lax pedicels 6–20, arcuate-nutant; calyx with broadly rounded lobes equaling tube; corolla 2.5–5 cm. long, the violet apiculate crenulate lobes subrotund, about a fourth as long as tube; stamens included, mostly longer than style; anthers sagittate, connective finally recurved; capsule ellipsoid, completely 2-celled.—Species exceptional in that the tetrad pollen is in packets and the tubercles high (Gilg). Illustrated, Gilg, l.c. 100, *fig. 45* (flower).

Loreto: Iquitos, *Tessmann 3683* (det. Dahlem herb.). Brazil.

Lisianthus viscosus R. & P. Fl. Peruv. 2: 14, *pl. 125.* 1799. *Macrocarpaea viscosa* (R. & P.) Gilg, Bot. Jahrb. 22: 337. 1896; 246.

Branches tetragonous sulcate, glandular-viscous above; leaves oval, rounded-obtuse both ends or barely acute, subsessile, the prominent veins beneath early puberulent, 1.5–2 dm. long, 9–14 cm. wide; panicles broadly corymbose, consisting of 3–5 laterally disposed congested 3–5-flowered cymules; calyx campanulate, small, rounded or subovate at base, tube lobes oblong-ovate, 1.5–2 mm. long, glandular-puberulent, concave; corolla open-campanulate, 4–5 cm. long, lobes subrotund-cordate, equal, finally spreading, 11–16 mm. long; anthers cordate; capsule ovoid-lanceolate, long-attenuate to short style, erect, 3.5–5 cm. long.—My specimen from a slender open shrub-tree of montaña. The inflorescence of this small shrub is covered with a white crystalline gum that dissolves in water and crackles in fire like gum arabic. F.M. Neg. 29362.

Huánuco: Muña and Tambo Nuevo, *Ruíz & Pavón*, type.—Junín: La Merced, *5224*.

8. **GENTIANA** [Tourn.] L.

Glyphospermum, *Selatium*, *Ulostoma* and *Eudoxia* G. Don, Gen. Syst. 4: 195–202. 1838. *Pitygentias* Gilg, Bot. Jahrb. 54: Beibl. 118: 90. 1916.

Reference: Gilg, Bot. Jahrb. 54: Beibl. 118: 4–89. 1916.

Smooth or nearly smooth annuals, biennials or perennials, herbs or more or less ligneous, with often colorful more or less campanulate flowers, these in Peru frequently solitary or few, sometimes many, then usually in cymes. Leaves occasionally verticillate. Floral parts ordinarily 5, rarely 4–8; corolla lobes convolute; stamens attached to tube; pollen grains large, the very fine muriculation in regular rows or reticulate. Nectaries present in corolla base or at base of 1-celled ovary.

According to Pliny, Gentius, King of Illyria, discovered that these plants had medicinal value, which found popular expression in a liqueur much appreciated even today, particularly in alpine areas; most of the Peruvian species grow at high altitudes and with the Nototriches are among the most attractive flowers of wet or low-shrub and grassland formation; unlike Gentians of the north temperate zone, the corolla is never fringed nor the color sky blue, but there is great variety in tints and degrees of brilliancy. Several species, especially those with scarlet flowers, serve the Indians for the *fiestas* of the Pfallchai, dedicated to stock fertility.

In acknowledging my indebtedness to the work of the monographer—the text is largely a translation of his descriptions—it may be observed that in conformity with most authorities he has meticulously emphasized differences detected in collections, while similarities have been described with many nuances. My attempt in a supplementary key (p. 299) to aid in determinations is not a declaration of character validities nor of relationship; under the circumstances neither key is effective or accurate for all materials; the corolla has been described originally as glabrous, unless otherwise stated.

The following species, based on specimens of Ruíz and Pavón (not identified by Gilg nor found at Madrid by myself) and essentially nomina nuda, as remarked both by Weddell and by Gilg, have been omitted: *G. Donii* Griseb. in DC. Prodr. 9: 93. 1845; *G. rima* G. Don, Gen. Syst. 4: 181. 1838. Several others are noted under species to which they have been referred with query by Gilg.

KEY (after Gilg)

Gilg excluded *G. prostrata* Haenke, i.e. *G. sedifolia* HBK., the only species with 10-lobed corolla; also *G. thyrsoidea* and *G. pinifolia*.

Corolla glabrous within and not fimbriate at throat (contrast, p. 298).
  Corolla lobes evidently longer than tube (contrast, p. 296).
    Plants mostly biennial (rarely annual), basal leaf rosette at anthesis usually more or less marcescent, central flowering stem mostly simple, rarely branched at base.
      Calyx lobes lanceolate, acute or acuminate.
        Cauline leaves always opposite .... *G. Graebneriana.*
        Cauline leaves at least in part verticillate.
          Flowers 15–18 mm. long .... *G. verticillata.*
          Flowers 2.5–3 cm. long .... *G. sanctorum.*
      Calyx lobes ovate or obovate, subrounded or shortly acute. *G. eurysepala.*
    Plants perennial, rosette well developed with flowering stems always axillary, mostly many (contrasts, p. 296).
      Plants low, mostly slender, the flowering stems usually slender, 1-flowered, rarely 2–3-flowered; rosette leaves small, short, membranous.
        Flowers at most 6–8 mm. long.
          Calyx lobes and patelliform tube subequal. *G. Brandtiana.*
          Calyx lobes and tube very unequal .... *G. Meyeniana.*
        Flowers more than 1 cm. long.
          Calyx lobes more or less obovate, rounded at tip.
            Corolla about 11 mm. long .... *G. lobelioides.*
            Corolla 16 or 17 mm. long .... *G. peruviana.*
          Calyx lobes obovate or -lanceolate, shortly acute; corolla to 2.5 cm. long .... *G. poculifera.*
          Calyx lobes ovate, shortly acute or subrounded; corolla at most about 2 cm. long.
            Corolla to about 2 cm. long.

Calyx lobes and tube subequal. . . . *G. porphyrantha.*

Calyx lobes much longer than tube. . *G. primuloides.*

Corolla scarcely 1.5 cm. long.

Flowers yellow, lobes after anthesis brown. *G. brunneotincta.*

Flowers violet or purple, not at all yellow.

Rosette leaves 2.5–3 cm. long, spatulate, petiolarly narrowed.

Corolla more than twice as long as calyx. *G. calcarea.*

Corolla little longer than large calyx. *G. primulifolia.*

Rosette leaves scarcely 1.5 cm. long, broadly spatulate, rather abruptly narrowed.

Leaves smooth. . . . . *G. luridoviolacea.*

Leaves papillose marginally. . . . . *G. saxicola.*

Calyx lobes ovate-lanceolate to lanceolate, acutely acuminate.

Calyx lobes shorter than or subequaling tube.

Rosette leaves spatulate, long pseudopetiolate; flowering stems only leafy below, somewhat erect. *G. sandiensis.*

Rosette leaves oblong or subspatulate, not or scarcely pseudopetiolate; stems more or less leafy, always curved-erect.

Calyx at anthesis subcoriaceous; flowers scarlet. *G. scarlatina.*

Calyx herbaceous; flowers rose-lilac. *G. roseolilacina.*

Calyx lobes evidently longer than tube.

Leaves and calyx fleshy coriaceous. . . . *G. petrophila.*

Leaves and calyx membranous.

Rosette leaves as stems suberect; calyx lobes recurved; flowers to 13 mm. long. *G. paludicola, G. limoselloides.*

Rosette leaves and stems curved-ascending; calyx lobes erect; flowers longer than 2 cm. *G. campanuliformis, G. dolichopoda.*

Plants mostly tall, stems many-flowered, rosulate leaves persisting, large and mostly fleshy coriaceous, usually much longer than cauline.

Rosettes dense, obovate leaves fleshy; flowers in short few-flowered cymes, yellowish; sterile shoots none.

Calyx lobes obovate, subrotund at tip. . *G. chrysosphaera.*

Calyx lobes broadly ovate or obovate, subacute, foliaceous . . . . *G. incurva.*

Calyx lobes lanceolate, acute . . . . *G. chrysotaenia.*

Rosettes dense, lanceolate or linear leaves fleshy coriaceous; flowers in elongate thyrse, lilac; sterile shoots none. *G. speciosissima.*

Rosettes lax, elongate, lanceolate leaves strongly narrowed to base, herbaceous; flowers rose or bluish; shoots none. *G. setipes.*

Rosettes lax but always appressed, leaves obovate, pseudopetiolate; flowers lilac to blue in few-flowered mostly lax cymes.

Apical flowers at most 15–17 mm. long, lobes 4 mm. wide; stem leaves lanceolate, short-acute or subrotund. *G. Pavonii.*

Apical flowers about 2 cm. long, lobes to 6 mm. wide; stem leaves ovate-lanceolate, acuminate. *G. cuspidata.*

Apical flowers about 2.5 cm. long, lobes to 8 mm. wide; stem leaves suboblong, obtuse to short-acuminate. *G. Bridgesii.*

Rosettes lax (mostly), leaves always somewhat erect, linear, subfleshy; flowers erect in mostly lax few-flowered cymes.

Leaves (cauline) always tristichous . . . . *G. tristicha.*

Leaves always 6-verticillate . . . . *G. lilacina.*

Leaves opposite.

Leaves narrowly linear, acicular, very acute; stems mostly 1–2-flowered.

Calyx lobes and tube subequal . . . . *G. graminea.*

Calyx lobes much longer than tube. *G. arenarioides.*

Leaves linear, rounded or little acute; stems always with normal cymes.

Basal leaves 7–8 cm. long.
  Calyx lobes much shorter than tube. *G. mesembrianthemoides.*
  Calyx lobes and tube subequal.... *G. Dombeyana.*
Basal leaves 2.5–3 cm. long or shorter.
  Flowers to 16 mm. long; calyx nerves prominent. *G. pachystemon.*
  Flowers to 2 cm. long; calyx nerves slender. *G. saxifragoides.*

Plants perennial, densely or very densely pulvinate, sterile and fertile stems crowded.
  Calyx lobes obovate, rounded at tip; flowers reddish-lilac. *G. muscoides.*
  Calyx lobes ovate or obovate, shortly acute..... *G. vaginalis.*
  Calyx lobes ovate-lanceolate to lanceolate, acute-acuminate.
    Leaves lanceolate; corolla 16 mm. long..... *G. armerioides.*
    Leaves linear-spatulate; corolla 4.5 cm. long... *G. Gilgiana.*

Shrubs, suffrutescent or rarely herbs, no basal rosettes, stem dense, inflorescence many-flowered, somewhat capitate, rarely pseudopaniculate.
  Inflorescence capitate, pedicels very short; leaves mostly ovate or broadly obovate, approximate, rarely oblong to lanceolate.
    Leaves lanceolate, herbaceous............... *G. radicata.*
    Leaves obovate or rarely ovate, often rigid. *G. pseudolycopodium.*
  Inflorescence racemiform, pedicels to 10 mm. long. *G. pernettyoides.*
  Inflorescence rather lax, pedicels obvious; leaves linear.
    Calyx lobes much longer than tube.
      Leaves subcoriaceous; flowers lilac, darker-striped, apical, about 2 cm. long.................... *G. oreosilene.*
      Leaves coriaceous; flowers red, apical 12 or 13 mm. long. *G. corallina.*
    Calyx lobes much shorter than tube.......... *G. coccinea.*

Tall plants, the erect stem with apical rosette before anthesis, later with ample inflorescence........... *G. formosissima.*

Tube of corolla as long as or mostly longer than lobes (cf. *G. stricticaulis,* not in accord with descriptions of a number of species —J.F.M.).

Low perennials, the stems always 1-flowered.
  Calyx lobes obovate, rounded; leaves pseudopetiolate. *G. carneorubra.*
  Calyx lobes ovate-lanceolate, acute; leaves ovate-lanceolate, sessile . . . . *G. alborosea.*
Shrubby or subherbaceous with approximate linear-lanceolate mostly acicular leaves; flowers small, subspicate or subcapitate.
  Flowers 16 or 17 mm. long . . . . *G. fruticulosa.*
  Flowers 10–12 mm. long.
    Stems 4-angled above but exalate . . . . *G. violacea.*
    Stems evidently alate above . . . . *G. lavradioides.*
  Flowers at most 7 or 8 mm. long.
    Stems papillose-pilose above only on ribs . . *G. ericothamna.*
    Stems above densely papillose-pilose all over. *G. hebenstreidtioides.*
Perennials or biennials with large rosulate leaves, many-flowered or subcapitate inflorescences.
  Flowers to 1.5 cm. long.
    Corolla tube and lobes subequal . . . . *G. Lobbii.*
    Corolla lobes shorter than tube . . . . *G. dissitifolia.*
  Flowers longer than 2 cm. . . . . *G. crassicaulis.*
Like the three preceding species but inflorescence always lax.
  Leaves few, all herbaceous, the rosettes lax.
    Corolla lobes about one-half as long as tube.
      Calyx lobes acuminate . . . . *G. dianthoides.*
      Calyx lobes acute, subrounded . . . . *G. scarlatiflora.*
    Corolla lobes equaling or subequaling the tube, rarely a little longer.
      Cauline leaves not at all connate at base.
        Inflorescence leaves lanceolate; apical flowers 2–2.5 cm. long . . . . *G. Stuebelii.*
        Inflorescence leaves ovate or oblong; apical flowers 14–17 mm. long . . . . *G. stricticaulis.*
      Cauline leaves connate at base (may not belong here). *G. Raimondiana.*
  Leaves coriaceous or fleshy-coriaceous, many, the rosettes dense.

Corolla lobes equaling or little shorter than the tube.

Rosette leaves obovate, rounded at tip; corolla tube yellow or green, lobes violet.

Flowers about 2.5 cm. long; leaves to 2 cm. wide. *G. dilatata.*

Flowers about 2 cm. long; leaves to 4.5 cm. wide. *G. Herrerae.*

Rosette leaves ovate or lanceolate, acute.

Flowers pseudoumbellate, scarcely 1 cm. long. *G. Andreae-Mathewsii.*

Flowers 3.5–4 cm. long........... *G. scarlatinostriata.*

Corolla lobes scarcely half as long as tube.

Calyx lobes much longer than tube, acute... *G. amoena.*

Calyx lobes and tube subequal, acute... *G. Weberbaueri.*

Calyx lobes much shorter than tube, acuminate.

Flowers scarcely 2 cm. long.............. *G. punicea.*

Flowers 2.5–3 cm. long.................... *G. ignea.*

Corolla tube at base or at insertion of stamens more or less pilose, or fimbriate at throat.

Corolla tube and lobes subequal or the former longer.

Corolla throat densely fimbriate.

Plants low, the stems mostly 1-flowered, the rosette leaves prostrate.

Corolla tube and lobes subequal........ *G. crossolaema.*

Corolla lobes shorter than the tube.

Calyx lobes lanceolate, subequaling tube. *G. trichostemma.*

Calyx lobes ovate, much shorter than tube.. *G. nitida.*

Plants tall, the long rosette leaves erect; flowers many. *G. umbellata.*

Corolla tube within more or less pilose.

Flowers large, more or less nutant............. *G. cernua.*

Flowers smaller, always erect.

Flowers 2–2.5 cm. long, small if solitary.

Leaves lanceolate; calyx tube nerves alate, curved. *G. centamalensis.*

Leaves linear-lanceolate; calyx tube nerves not alate, straight........................ *G. potamophila.*

Flowers to 3 cm. long, solitary in type....... *G. Ernesti.*

Tube of corolla much shorter than lobes.

Stout-rooted perennials with many large fleshy coriaceous leaves.

Flowers many, about 2 cm. long; corolla tube densely pilose within.............................. *G. calanchoides.*

Flowers few, about 3 cm. long; corolla tube with a few long trichomes within........................ *G. exacoides.*

Slender-rooted biennial with a lax rosette.......... *G. liniflora.*

Low perennials, sterile shoots short, flowers solitary or few, lobes obovate, rounded.

Sterile shoots appressed; flowers mostly solitary.. *G. rupicola.*

Sterile shoots erect; flowers mostly many..... *G. cerastioides.*

Low fibrous-rooted perennials with small membranous-coriaceous leaves.

Peduncles elongate, often 6 cm. long........ *G. persquarrosa.*

Peduncles about 2 cm. long, from axils of rosulate leaves. *G. luteomarginata.*

Robust perennials with large rosulate leaves, many large (3–4.5 cm. long) flowers.

Flowers nearly 3 cm. long, borne on many stems. *G. chamuchui.*

Flowers 4–4.5 cm. long, borne on a stem floriferous from base to apex................................ *G. regina.*

GENTIANA, SUPPLEMENTARY KEY

Stems with 1–3 (rarely more) apical or subapical flowers or sometimes with 1–3 short or elongating branches with usually 1 flower, rarely a dm. tall, now and then somewhat taller. See also *G. saxifragoides* and other subligneous species.

Corolla barbate-fimbriate at throat (cf. also *G. longibarbata*).

Calyx lobes lanceolate, longer or little shorter than tube.

Corolla lobes and tube subequal or the former shorter.

Leaves lanceolate, free or nearly; corolla lobes and tube subequal........................... *G. crossolaema.*

Leaves connate basally; corolla lobes shorter than tube. *G. trichostemma, G. graminea.*

Corolla lobes clearly longer than tube.

Leaves imbricate; plants low, cespitose........ *G. rupicola.*

Leaves remote (cauline), plants 1 dm. tall or taller.
Flowers erect; leaves about 3 mm. wide. . *G. cerastioides.*
Flowers subnutant; leaves to 5 mm. wide. . . . . *G. cernua.*
Calyx lobes ovate, much shorter than the tube. . . . . . . *G. nitida.*
Corolla glabrous or rarely more or less pilose in tube.
Leaves in types only 4–10 mm. long (some sometimes longer) but with a more or less obvious pale often finally white margin and often more or less cartilaginous or plants developing mats from the branching caudex, many stems.
Corolla with plaits or pseudo-lobes between the 5 lobes. *G. sedifolia.*
Corolla simply 5-lobed.
Calyx lobes acute or subacute, subequaling tube; leaves often scabrous-margined or papillose.
Leaves described as not vaginate, basal to spatulate-obovate. . . . . *G. saxicola.*
Leaves somewhat vaginate, narrowly if at all spatulate.
Corolla 1 cm. long. . . . . *G. vaginalis.*
Corolla 15–18 mm. long. . . *G. alborosea, G. armerioides.*
Calyx lobes obtuse; leaves smooth (ex char.).
Corolla to 18 mm. long; calyx lobes and tube subequal. *G. Meyeniana.*
Corolla to 12 mm. long.
Calyx lobes longer than tube. . . . . *G. muscoides.*
Calyx lobes shorter than tube. . . . . *G. lobelioides.*
Leaves at least the basal ones usually 1 cm. long or longer or (and) quite herbaceous, sometimes firm-fleshy, not obviously margined; stems 1 or few, not or laxly branched. (*G. Brandtiana* and diminutive individuals of several species may have shorter leaves.)
Corolla tube at filament insertion somewhat pilose; flowers pale or bicolored, partly purple, greenish-blue or yellow, finally about 2–3 cm. long except *G. persquarrosa* (expedient division; see similar glabrous corolla species).
Stems with 2–3 pairs of remote leaves above the basal ones, often lax, to 1 dm. long or longer; flowers in part purple, blue or red striped or lilac. (*G. centamotensis*, stem ligneous below, might be sought here.)
Calyx lobes subobovate, rounded, subequaling tube; stems lax. . . . . *G. persquarrosa.*

Calyx lobes suboblong, subacute or obtuse; flowers to 2 cm. long .... *G. potamophila.*

Calyx lobes linear-lanceolate, acuminate; flowers to 3 cm. long.

Leaves drying firm as stems .... *G. exacoides.*

Leaves drying lax .... *G. Ernesti.*

Stems scapose, leaves near or at base, about 5 cm. high; flowers more or less yellow .... *G. luteomarginata.*

Corolla tube glabrous; flowers sometimes brightly colored.

Calyx lobes rounded or subacute by minute mucro or cusp, shorter than tube, scarcely if ever twice as long as wide.

Flowers solitary, 12–15 mm. long, dark-colored or yellow-edged .... *G. luridoviolacea.*

Flowers solitary, about 2 cm. long, deep red. *G. carneorubra.*

Flowers several, yellowish, 13–14 mm. long. *G. chrysosphaera.*

Flowers solitary, to 2 cm. long, lavender-pink. *G. peruviana.*

Calyx lobes usually subacute to acuminate, often as long as tube or longer, at least twice as long as wide at full anthesis, if subobtuse, flowers usually larger, bright yellow and red.

Flowers about 2 cm. long or longer, at full anthesis.

Flowers pale or tinted, sometimes bicolored.

Leaves all subsetaceous, about 1 mm. wide. *G. arenarioides.*

Leaves about oblong or oblanceolate.

Stems procumbent-ascending to suberect; leaves lax .... *G. dolichopoda.*

Stems as basal leaves drying firm, erect. *G. Bridgesii.*

Flowers red or partly yellow or orange (cf. *G. primuloides*).

Flowers to 2 cm. long at full anthesis.

Corolla scarlet, yellow striate .... *G. chrysotaenia.*

Corolla scarlet or partly edged in yellow, or yellow and red .... *G. porphyrantha, G. primulifolia.*

Flowers about 2.5–3 cm. long at full anthesis. *G. incurva.*

Flowers 1– about 1.5 cm. long (expedient character).

Stems usually simple, 1 (–2) -flowered, the extra flower if present usually on short branch or peduncle; plants ordinarily 5–8 cm. high.

Flowers bright orange, red, or red and yellow. *G. scarlatina, G. primuloides.*

Flowers variously tinted, pale (sometimes yellow, as *G. sandiensis*).

Basal as stem leaves sublinear, about 2 mm. wide. *G. petrophila.*

Basal as stem leaves wider, sometimes oblong.

Stems apparently scapose, leaves basal or subbasal; flowers more or less bicolored. *G. sandiensis.*

Stems with 1–several pairs of leaves above the lowest; flowers usually unicolored or tube yellow.

Petiole-like part of basal leaves obscure.

Calyx lobes lanceolate, acute. *G. roseolilacina.*

Calyx lobes suboblong, subacute. *G. brunneotincta.*

Petiole-like part of basal leaves more or less well-defined. . *G. calcarea, G. limoselloides.*

Stems mostly with 1–3 simple erect 1-flowered branches, often 1.5 dm. tall. . . . . *G. paludicola.*

Stems mostly with 1–several lax elongating 1-flowered, often subfiliform branches usually about 1.5 dm. tall. . . . . . . *G. poculifera, G. Pavonii, G. cuspidata.*

Stems usually several to many-flowered (flowers frequently more or less in cymes), if leafless and slender at base often subligneous and sometimes 1–few-flowered, often stout, in any case commonly about 2–many dm. tall.

Flowers all 3–4 cm. long, lobes and tube subequal unless in *G. formosissima.*

Flowers many on single or several stems, somewhat pilose within.

Stem leaves broadly ovate at base.

Plants many-stemmed, loose keg-shaped polsters. *G. chamuchui.*

Plants with a single stout stem, tall............*G. regina.*

Stem leaves rather oblong-lanceolate.......*G. formosissima.*

Flowers few or on some stems solitary, glabrous.

Leaves ovate-lanceolate................*G. scarlatinostriata.*

Leaves narrowly linear......................*G. Gilgiana.*

Flowers to about 3 cm. long (terminal), often much shorter.

Stems usually stout toward foliose base, commonly 5–10 mm. thick.

Leaves rigid coriaceous, linear-lanceolate, acuminate. *G. speciosissima.*

Leaves herbaceous or fleshy coriaceous.

Leaves ovate-lanceolate, basally connate.

Flowers few, 2.5–3 cm. long, barbate.

Corolla fimbriate at throat..........*G. longibarbata.*

Corolla glabrous........................*G. foliosa.*

Flowers many, about 2 cm. long, glabrous.

Rosulate leaves oblong-lanceolate.....*G. crassicaulis.*

Rosulate leaves broadly spatulate........*G. Herrerae.*

Leaves linear or linear-lanceolate, free.

Calyx lobes ovate, subequaling tube; flowers few, at tips of long branches.................*G. Raimondiana.*

Calyx lobes ovate-lanceolate; flowers many.

Calyx and corolla lobes longer than tube. *G. verticillata, G. sanctorum.*

Calyx lobes somewhat, corolla lobes much shorter than tube.

Flowers lax, subnutant, narrowly tubular. *G. Weberbaueri.*

Flowers erect, crowded, subfunnelform. *G. pinifolia, G. thyrsoidea.*

Stems slender, scarcely or rarely 5 mm. thick even at or above base or (and) scarred and leafless at often ligneous base.

Leaves setaceous to sublinear, mostly 1– about 4 mm. wide (*G. diantheoides* has leaves dilated at base, flowers partly cymose).

Leaves verticillate (cf. *G. arenarioides,* flowers few).

Leaves 6-verticillate.......................*G. lilacina.*

Leaves tristichous........................*G. tristicha.*

Leaves, at least of flowering stems, all opposite.
  Flowers about 8 mm. long, violet. *G. hebenstreidtioides, G. violacea.*
  Flowers usually 12 mm. long or longer, most often red.
    Corolla lobes more or less clearly shorter than tube. *G. lavradioides, G. ericoides, G. coccinea.*
    Corolla lobes about as long as tube, sometimes longer (species in part doubtful, size of flowers expedient character).
      Corolla 10–17 mm. long, lobes usually somewhat longer than tube.
        Flowers crowded at branchlet tips.
          Stems strict, sparsely branched above. *G. hyssopifolia.*
          Stems diffuse, much branched above base. *G. ericothamna, G. radicata.*
        Flowers in apical cymes . . . *G. Andreae-Mathewsii.*
        Flowers laxly pseudoracemose.
          Corolla tube broadly obconic, lobes rounded. *G. corallina.*
          Corolla tube subcylindric, lobes acute or subacute . . . . *G. pachystemon, G. oreosilene.*
      Corolla, at least apical, 2 cm. long or longer.
        Stems somewhat ligneous toward leafless base.
          Leaves papillose . . *G. fruticulosa, G. saxifragoides.*
          Leaves smooth . . . . *G. graminea.*
        Stems not ligneous; basal leaves more or less marcescent (see also *G. arenarioides*).
          Leaves not dilated at base, acute.
            Leaves long-connate basally. *G. mesembrianthemoides.*
            Leaves scarcely or shortly connate. *G. Dombeyana.*
          Leaves dilated at connate base, acuminate. *G. dianthoides.*
Leaves rhombic-obovate or oval-oblong, about 5 mm. wide, as long as wide, or not much more than two or three times longer.

Leaves with appressed petiole, obovate, longer than wide, rigid . . . . *G. pernettyoides.*

Leaves sessile, imbricate, about as wide as long. *G. pseudolycopodium.*

Leaves obovate or oblong to lanceolate, sometimes narrowly but then long-acuminate.

Stem leaves obviously connate at base, narrowly lanceolate, acute or acuminate unless *G. calanchoides.*

Corolla glabrous, about 2 cm. long, lobes much shorter than tube . . . . *G. amoena.*

Corolla often longer than 2 cm., lobes and tube subequal.

Leaves acute, 3–8 mm. wide; corolla pilose in tube.

Flowers few, often 3 cm. long . . . . *G. exacoides.*

Flowers several, 2 to scarcely 2.5 cm. long.

Calyx lobes rather acuminate . . . . *G. calanchoides.*

Calyx lobes mucronate-acute . . . . *G. centamalensis.*

Leaves acuminate, upper about 3 mm. wide; corolla glabrous . . . . *G. Bridgesii, G. dianthoides.*

Stem leaves little or not connate unless uppermost, mostly oblong, narrowly ovate-lanceolate or basal oblanceolate to obovate (*G. primulifolia* sens. lat. might be sought here).

Flowers scarlet; corolla lobes shorter than tube.

Stems erect; cauline leaves remote.

Calyx lobes and tube subequal . . . . . . *G. scarlatiflora.*

Calyx lobes much shorter than tube . . . . *G. ignea.*

Stems lax, suberect; cauline leaves imbricate. *G. punicea.*

Flowers tinted, sometimes roseate (color unknown, *G. Lobbii, G. Andreae-Mathewsii*); corolla lobes and tube subequal or former longer except *G. dissitifolia.*

Leaves mostly or all 5–15 mm. wide.

Corolla lobes distinctly shorter than tube; leaves remote, 5–10 mm. wide . . . . *G. dissitifolia.*

Corolla lobes and tube subequal or former only somewhat shorter, rarely longer than latter.

Corolla at least in throat glabrous.

Apical flowers about 2 to nearly 3 cm. long.

Cauline leaves about a third to nearly half as wide as long, ovate, broad-based.
  Corolla with few trichomes at base within. *G. liniflora.*
  Corolla glabrous; calyx pubescent within. *G. setipes.*
Cauline leaves about a fourth as wide as long, sessile, not broad-based. (*G. foliosa* with apically congested flowers, imbricate leaves might be sought here.)
  Leaves subobtuse .... *G. eurysepala.*
  Leaves more or less acutely acuminate.
    Corolla tube sparsely pubescent. *G. exacoides.*
    Corolla tube glabrous ...... *G. Stuebelii.*
Apical flowers about 1.5 cm. long.
  Leaves acute, stems indurate at base. *G. stricticaulis, G. Lobbii.*
  Leaves subobtuse; cauline to 6 cm. long; stems herbaceous .... *G. Graebneriana.*
Corolla more or less densely barbate at throat. *G. umbellata.*
Leaves to about 3 mm. wide, 2 cm. long. *G. Andreae-Mathewsii.*

Gentiana alborosea Gilg, Bot. Jahrb. 54: Beibl. 118: 55. 1916.

Low, densely pulvinate, only 3 or 4 cm. high but often 1–1.5 dm. across from a rather slender elongate root supporting the much-divided caudex, the prostrate portions densely covered with leaf-remains, the many erect leafy flowering stems about 2 cm. high, with some sterile stems intermixed; leaves opposite, approximate, oblong, little narrowed to vaginate base, acutish, 6–7 mm. long, scarcely 2 mm. wide, somewhat fleshy, often marginally papillose; flowers always solitary on slender pedicels 10–13 mm. long; calyx about 8 mm. long, campanulate-cylindric tube 5 mm. long, 4–5 mm. in diameter, subovate-acute lobes 3 mm. long, 2 mm. wide at base, nerves subcarinately prominent; corolla finally 15–18 mm. long, cylindric tube 7 or 8 mm. long, 4–5 mm. across, the rounded lobes 8–9 mm. long, nearly as wide.—Flowers whitish, the lobes more or less roseate. Looks much like *G. nitida* except for lack of barbate corolla. As previously in this work (unless by oversight) the hyphen has been deleted in specific names composed of two words as here, even when used by the author, since the vowel forms the connection as in *G. scarlatinostriata* Gilg. Perhaps a Poeppig specimen, herb. Vienna, from "Sierra la Viuda, Peru" belongs here (Gilg). F.M. Neg. 10272.

Junín: Bunch grass formation, northeast of Comas, Prov. Juija, 4,100 meters, *Weberbauer 6624*, type.

Gentiana amoena Wedd. Chloris And. 2: 70. 1859; 68.

Perennial with a rather thick little fibrous root, a short caudex with a few old leaves, a single rosette of fleshy herbaceous leaves and an erect strict flowering stem 3–4 dm. tall, the lower internodes 2, the upper to 5 cm. long; leaves obviously 7-nerved, all narrowly lanceolate, acute, not at all narrowed to the base where as much as 5 mm. connate, the lower (and basal) 5–7 cm. long, 3 mm. wide, gradually reduced to about 17 mm. long, 3 mm. wide; flowers more or less nutant, in an apical cyme and from all the upper axils forming a narrow pseudopanicle or raceme more than 2 dm. long; peduncles 2.5–4 cm. long, pedicels 1.5–2 cm. long; calyx subcoriaceous, nerves prominent, about 12 mm. long, campanulate tube 5 mm. long, 5–6 mm. wide at top, ovate to linear-lanceolate, acuminate lobes nearly 7 mm. long, 2 mm. wide at base; corolla 2–2.2 cm. long, cylindric tube little inflated above the middle, about 1.5 cm. long, 8 mm. across, the obovate lobes 5 or 6 mm. long, nearly as wide.—Flowers apparently with yellowish tube and brick-red lobes. After Gilg from a Lobb specimen without number which ex char. he was certain must be part of the original; scarcely from Ecuador since its relationship is evidently with species known only from Peru or Bolivia (Gilg). The author himself allied it to his *G. punicea* and described it as annual or biennial, basal leaves spatulate, obtuse, cauline, linear-lanceolate, acute, calyx lobes linear-lanceolate, corolla about 2.5 cm. long, brilliant red, to judge from the dried specimen. F.M. Neg. 10273.

Peru (?): Without data, *Lobb*, type.

Gentiana Andreae-Mathewsii Briquet, Candollea 4: 326. 1931. *G. Mathewsii* Gilg, Bot. Jahrb. 54: Beibl. 118: 64. 1916, not Petrie, 1912. *G. liniflora* HBK. var. *gracilis* Griseb. Gent. 235. 1838.

Perennial from a rather stout little-branched root, the thick caudex crowned with old leaves and a dense rosette of leaves rising around the ascending-erect flowering stem, this simple, to 1 dm. tall; leaves all narrowly lanceolate, fleshy herbaceous, the basal and lower cauline subequal, about 2 cm. long, 3 mm. wide, little narrowed to base, long-acute, reduced upward to 1 cm. long, not at all connate, obsoletely 3–5-nerved; flowers somewhat nodding in umbelliform apical cymes, pedicels 10–13 mm. long, calyx 7 mm. long, obconic tube 4 mm. long, scarcely 3 mm. wide, lobes linear-acuminate, nerves prominent; corolla 1 cm. long, cylindric tube 6 mm. long, scarcely half as wide, lobes oblong, about 2.5 mm. wide.—Has nothing whatever to do with *G. liniflora* (Gilg); the author at one time referred the type of *G. incurva* Hook. with query. Ex char. seems to be allied to *G. oreosilene* Gilg, etc.

Amazonas: Chachapoyas, (*Mathews*, type).

Gentiana arenarioides Gilg, Repert. Nov. Sp. 2: 39. 1906; 45.

Habit nearly of *G. tristicha* but few-flowered and leaves subequal, those of flowering stems always(?) opposite, those of the sterile shoots often ternate, 12–25 mm. long, 1 mm. wide, subpungent; flowers often solitary, rarely 2 in upper axils, the pedicels 2–7 cm. long; calyx narrowly campanulate, 14 or 15 mm. long, lobes 8–10 mm. long, corolla 2.5–2.8 cm. long, the obovate rounded lobes longer than obconic-cylindric tube.—The elongate scapiform upper flowering stems give it a different aspect from the related(?) *G. graminea*, as to types. It seems, except for its 1–3 flowers, related to *G. tristicha* and *G. mesembrianthemoides*. It has similarly densely tufted basal leaves at time of flowering. Flowers pale lilac with yellowish tube. F.M. Neg. 10276.

Cajamarca: In dense growth of herbs and shrubs, 3,400 meters, Hualgayoc, *Weberbauer 3995*, type.

Gentiana armerioides Griseb. ex Gilg, Bot. Jahrb. 54: Beibl. 118: 50. 1916.

Densely pulvinate, 5 or 6 cm. high, 7–8 cm. across with many sterile or flowering stems from the closely rosulate leaves, these lanceolate (or oblanceolate), scarcely narrowed at base, acute, about 1 cm. long, 2 mm. wide, fleshy coriaceous, the cauline slightly shorter, somewhat connate at base, often 4 pseudoverticillate; flowers probably fiery red, solitary, the pedicels 15–18 mm. long; calyx about 7 mm. long, obconic-campanulate tube 3 mm. long, lanceolate or ovate-lanceolate lobes acute, 3–4 mm. long, nerves prominent; corolla about 16 mm. long, tube obconic-cylindric, 6 mm. long, 5 mm. thick above, the oblong or oblong-obovate lobes subrounded, about a cm. long, 4 mm. wide.—Corolla of Weberbauer specimen pale yellow, lobes red-edged; leaves oblanceolate, some 2 cm. long. F.M. Neg. 10277.

Cuzco: In rocks, 4,500 meters, *Weberbauer 7769?*—Puno: Agapata, *Lechler 2000a*, type.

Gentiana Brandtiana Gilg, Bot. Jahrb. 50: Beibl. 111: 48. 1913; 29.

Diminutive, acaulescent, the rosette about 1 cm. across, leaves all basal, few, flowers solitary or binate; leaves obovate or oblanceolate, subrotund at apex, gradually long-narrowed to base, 4–6 mm. long, 2–3 mm. wide; flowers whitish, pedicels slender, 1–1.5 cm. long, the campanulate-obconic calyx 3–4 mm. long, tube 2–2.5 mm. long, ovate lobes acute; corolla 5–6 mm. long, tube not exserted, lobes little longer, ovate, more or less acute; stamens and tube subequal.—Related to *G. peruviana* and possibly has a synonym in *G. limoselloides* HBK. var. *pusillima* Wedd. Chloris And. 2: 52. 1859 (Gilg).

Huancavelica: Santa Ines Mine near Ayacucho, in polster mats, 4,300 meters, *Weberbauer 5455*, type.

Gentiana Bridgesii Gilg, Bot. Jahrb. 22: 316. 1896; 44.

Stout caudex crowned with many erect rosulate firm-membranous lanceolate leaves and 2 to several laxly leafy stems 1.5–2 dm. tall terminating sometimes in mostly 3-flowered cymes, but flowers often solitary with another 1 or 2 from the upper axils; leaves all subobtuse or the upper shortly acuminate, the rosulate narrowed to base but not petiolate, 4–8 cm. long, 5–7 mm. wide, cauline, oblong-lanceolate, clearly cuneate at base, 2.5–3.5 cm. long, 3–5 mm. wide; calyx 12–15 mm. long, the narrowly lanceolate subacute lobes longer than tube, nerves prominent; corolla about 2.5–3 cm. long, the obovate rounded lobes about equaling the tube.—Author describes type as mostly with an apical 3-flowered cyme; however, photo of Dahlem specimen shows 1- and 2-flowered stems; Weberbauer specimen not seen; may be an earlier name for *G. exacoides*, but type with glabrous corolla tube. Flowers white but pale lilac or violet without. F.M. Neg. 10283.

Cuzco: Pachahusán, 4,400 meters, *Herrera 2572* (distr. as *G. sandiensis*).—Puno: Above Cuyocuyo, Prov. Sandía, 4,000 meters, (*Weberbauer 1048*, fide Gilg). Bolivia.

Gentiana brunneotincta Gilg, Repert. Nov. Sp. 2: 37. 1906; 32.

Small, acaulescent, the rather thick root with a moderate-sized rosette of oblanceolate acutish leaves, pseudopetiolate to base, 1.5–

2 cm. long, 3 mm. wide, remote, decreased and much smaller on the many erect-spreading stems, these 2–5 or 6 cm. long and "always 1-flowered," the pseudopeduncle or pedicel 1–2 cm. long; calyx narrowly campanulate, 5 or 6 mm. long, the ovate-oblong subacute lobes about as long as the tube, around 1 mm. wide; corolla 11–14 mm. long, the obovate obtuse lobes and obconic-cylindric tube subequal. —Seems allied to *G. dilatata* Griseb. (Gilg); later he classified it near *G. primulifolia* Griseb. Maybe distinct from *G. limoselloides* on the basis especially of the subobtuse calyx lobes and flower color; in type there are at least two flowers on one or more stems; the calyx lobes are not rounded or longer than tube as described except in young state. Name originally with hyphen but as elsewhere in this work deleted. Flowers yellow, later tipped with brown. F.M. Neg. 10285.

Ancash: In brush-grass formation above Huaraz, 3,800 meters, *Weberbauer 3092*, type.

Gentiana calanchoides Gilg, Bot. Jahrb. 22: 330. 1896; 76. *Ulostoma filamentosa* G. Don, Gen. Syst. 4: 196. 1838? *G. filamentosa* (G. Don) Griseb. in DC. Prodr. 9: 94. 1845?

Stout-rooted with a dense rosette of narrowly lanceolate ligulate leaves and apparently with 1–3 curved-ascending stems about 1.5 dm. long; leaves all similar, acute or acuminate, chartaceous, basal narrowed to base but not petiolate, 6 or 7 cm. long, 3–7 mm. wide, the cauline 3–3.5 mm. long, 5–8 mm. wide, a little connate; flowers mostly in 3-flowered cymes more or less forming a corymb; pedicels 7–15 mm. long; calyx 13 or 14 mm. long, the lanceolate acuminate lobes longer than tube; corolla 2–2.3 cm. long, the narrowly campanulate tube densely barbate within, shorter than the obovate-oblong apically rounded lobes, 7–8 mm. wide.—See *G. primulifolia* with, however, glabrous corolla. *G. longibarbata* is barbate in the throat as *G. diffusa* HBK., the latter with well-pedicelled flowers. My specimen subdecumbent at base, flowers greenish-cream, sometimes slightly pink. Possibly but not certainly, from the poor description of Don, the latter's name applies to this plant; as Gilg remarks, the name (as others of Don in this genus) should be considered a nomen nudum. Don wrote: cespitose, the stems 5 cm. high, erect; leaves linear-lanceolate, acute, marginally scabrous, obscurely 3-nerved, aggregate below; flowers umbellate; calyx segments ovate-lanceolate, acute; corolla infundibuliform, long-barbate within. F.M. Neg. 10287.

Huánuco: Grassy slope, *1811* (det. Gilg, *G. dianthoides?*).—Junín: Tarma, *Ruiz & Pavón*, type. "Rima-rima."

Gentiana calcarea Gilg, Repert. Nov. Sp. 2: 42. 1906; 32.

Root fusiform, stout, the apical leaf-rosette dense, the few to many spreading-erect stems usually simple, 7–11 cm. long; basal leaves oblong-spatulate, more or less acute, long pseudopetiolate, this part sometimes 10–13 mm. long, the blade somewhat longer, the many opposite cauline leaves lanceolate, acute, narrowed and slightly connate at base; flowers often solitary, rarely also 2 or 3 on short branches from upper axils, the pedicels 1.5–3 cm. long; calyx campanulate, 6 or 7 mm. long, the ovate-lanceolate somewhat acute lobes little longer than the tube; corolla 13–17 mm. long, the acutish obovate lobes little longer than short tube.—Affine *G. paludicola* (Gilg); nearly *G. brunneotincta* but may be separable on flower color and subacute somewhat narrower calyx lobes, or apparently *G. limoselloides*, sens. lat. Corolla lobes described as much longer than tube; certainly a slip, as in type they are actually subequal. Petals dull violet or reddish-green. F.M. Neg. 10288.

Junín: In lime rocks, 4,000 meters, Tarma to La Oroya, *Weberbauer 2539*, type.

Gentiana campanuliformis Reim. Bot. Jahrb. 62: 324. 1929.

Resembles *G. dolichopoda;* leaves membranous, the rosette ones narrowly spatulate or cuneate, subacute, petiole-like lower portion 3–4 cm. long, the upper part 7 mm. wide, 2–2.5 cm. long; cauline leaves 3–5 pairs, lanceolate, 0.5–1.5 cm. long, 1.5–3 mm. wide; flowering stems from axils of rosette leaves, ascending, mostly 1-flowered, rarely also in the axils of cauline leaves, peduncles 2–6 cm. long, flowers at anthesis mostly erect; calyx campanulate, membranous, 7–15 mm. long, the narrow acuminate lobes about one and a half times longer than tube, slightly lax in age; corolla 2–2.5 cm. long, the broadly obovate about 7 mm. wide, acutish, twice as long as tube. —Flowers clearly red; compared by author with the similar *G. mendocina* Gilg with erect calyx lobes, flowers scarcely 1.5 cm. long; it is thus, if his relationship is correct, seemingly an individual intermediate with that species and *G. dolichopoda,* which in turn belongs to *G. limoselloides,* sens. lat.

Cuzco: Hacienda Ecapana, Valle del Paucartambo, 2,700–2,900 meters, *Herrera 680,* type. Hacienda Churú, Prov. Paucartambo, 3,700 meters, *Herrera 1037* (distr. as *G. scarlatina*). Rodadero, *Vargas 3144?* (distr. as *G. sandiensis*). "P'allcha" (Vargas).

Gentiana carneorubra Gilg, Bot. Jahrb. 54: Beibl. 118: 55. 1916. *G. tubulosa* (Griseb.) Gilg, Repert. Nov. Sp. 2: 34. 1906, not

Gilg, Bot. Jahrb. 22: 315. 1896. *G. limoselloides* HBK. var. *tubulosa* Griseb. Gent. 215. 1838?

Diminutive perennial with a relatively stout root, 1–2 rosettes (a cm. or two across) of pseudopetiolate leaves and a single flower, the peduncle or scapose stem 1–2 cm. long; leaves to 2 cm. long, the spatulate blade portion about 5–10 mm. long, obtuse, about 2 mm. wide; calyx 8–10 mm. long, the broadly oblong-spatulate apically rounded or even subrotund lobes 1.5–3 mm. long, fleshy as the leaves in age; corolla tubular, 1.5 to finally 2 cm. long, 5 or 6 mm. wide, the subrotund lobes only 4 or 5 mm. long.—Name originally written with hyphen. Grisebach described corolla limb and tube as subequal but since his observations as regards flowers were often in error I hope that my identification of his type, not seen by me, but ex char. otherwise conforming, is correct (Gilg). Flowers dark flesh-red (Weberbauer); scarlet in my collection. F.M. Neg. 10300 (*Weberbauer*).

Junín: Cerro de Paseo, (*Mathews*, type). In wet puna on volcanic rock, near Yauli, 4,400 meters, *Weberbauer 278.* Morococho, *890; Verne Grant 7564.*

Gentiana centamalensis Gilg, Bot. Jahrb. 22: 334. 1896; 74.

Stem ligneous, about 1 dm. high or probably taller (basal portion unknown), the sometimes many curved-erect branches densely leafy with usually 1 or 2 flowers from the uppermost axil in addition to the terminal; cauline leaves suboblong or oblong-lanceolate, acute, narrowed to shortly connate base, 10–14 mm. long, 2–2.5 mm. wide, membranous, opaque, obscurely nerved; pedicel (or peduncle) 2.5–3.5 or terminal to 7 cm. long; calyx 12 or 13 mm. long, lobes ovate-lanceolate, the mucronate-acute tip sometimes recurving, about as long as tube, slightly curved-alate by the principal nerves; corolla 2.3–2.5 cm. long, the broadly obovate rounded lobes subequaling the obconic tube, this densely barbate within as the base of the filaments, and the notably prominent nectaries.—Said by author to be nearest *G. Jamesoni* Hook. of Ecuador with subumbellate flowers about 3 cm. long; it suggests to me *G. cernua* HBK. and the normal stem of type is procumbent-ascending; the branched stems are possibly the result of browsing. F.M. Neg. 10291.

Amazonas: Puna about Centamal, Pacasmayo to Moyobamba, *Stuebel 41*, type.

Gentiana cerastioides HBK. Nov. Gen. & Sp. 3: 169, *pl. 222.* 1819; 78.

Stem procumbent, then ascending-erect or with 1 or more ascending branches, 1 dm. tall or taller; flowers 1 or 2 or also 1 in the upper axil, subcampanulate, erect, about 2.5 cm. long; pedicels 2 cm. long or longer; leaves rather fleshy, glabrous, oblong-linear, obtuse, nearly free, lower approximate, 12–16 mm. long, about 3 mm. wide or somewhat larger; calyx 1.5 cm. long, the lobes narrowly ovate-lanceolate, acute or acuminate, somewhat exceeding the tube; corolla lightly barbate in throat, the obovate-oblong obtuse lobes longer than tube; filaments glabrous.—Perhaps extending into Peru from Ecuador and apparently similar to Peruvian species imperfectly known. F.M. Neg. 10412.

Peru (possibly). To Colombia.

Gentiana cernua HBK. Nov. Gen. & Sp. 3: 170. 1819; 71.

Stems erect-ascending, to 1.5 dm. tall, either simple or somewhat branched below, 1–3-flowered, the lower leaves approximate; leaves opposite, subconnate, oblong-lanceolate or ovate-lanceolate, acute or subobtuse, rather fleshy, 1–1.5 cm. long, 3–5 mm. wide; flowers red, rather nutant, 2.5 cm. long, usually 1 terminal and 1 or 2 in the upper axils, pedicels 1–2 cm. long; calyx 10–17 mm. long, the lobes acute-lanceolate, acute or acuminate, longer than tube; corolla lightly barbate in throat, campanulate, the oblong or obtuse lobes exceeding the tube; filaments glabrous.—*G. centamalensis* Gilg is apparently similar but the distribution of the corolla pubescence may be different. Said to form warts, the flowers some shade of red, sometimes with yellow tube or lines. F.M. Neg. 10292.

Peru (possibly). Ecuador.

Gentiana chamuchui Reim. Bot. Jahrb. 62: 333. 1929.

Showy perennial with a thick fusiform root, the caudex 4 cm. across, densely clothed with dried leaves; leaf-rosette a dm. high, nearly twice as broad, with 10 or more curved-erect flowering stems apparently from its leaf-axils, all about equally long (3 dm.), much branched from base, slenderer portion little branched, densely foliate, and multiflowered; rosulate leaves spatulate-cuneate, subrounded and subapiculate, to 10 cm. long, 2 cm. wide near tip, 5–7 mm. wide near base, coriaceous as the broadly ovate subacutely acuminate cauline, these about 2 cm. long, 8 mm. wide, somewhat connate; flowers erect, nearly 3 cm. long, peduncles 1–2 cm. long; calyx campanulate, 12 mm. long, tube 4 mm. long, very acute lanceolate lobes twice as long; corolla campanulate, 2–8 cm. long, lilac, the tube 6 mm. long, with many long trichomes at insertion of filaments, the oblong acute lobes 7 or 8 mm. wide, more than three times longer than the tube.—Single plant had nearly 100 flowers, the many stems forming a low loose polster, rather shaped like half a keg in contrast to the similar but single-stemmed *G. regina*, that attaining 12 dm. (Reimers); stock may have browsed it in an early stage.

La Libertad: Grass steppe at glacier Huaylillas, Huamachuco, 4,400 meters, *Weberbauer 7010*, type. "Chamuchui."

Gentiana chrysosphaera Gilg, Bot. Jahrb. 54: Beibl. 118: 37. 1916.

Tufted perennial with several yellowish flowers mostly 2–4 from the upper leaf axils of the rather stout stems, these in type 5–7 cm. tall, the fusiform root with short caudex covered with leaf remains and rosulate obovate leaves that are gradually narrowed to base, rounded at tip, 2.5–3 cm. long, 7–9 mm. wide; cauline leaves similarly fleshy but sessile, ovate to oblong, acutish, to 12 mm. long, 4–5 mm. wide; calyx tube campanulate, 5 mm. long, nearly 6 mm. broad, the distinctly apiculate ovate-rounded lobes 3 mm. long, 2 mm. wide, prominently nerved; corolla yellowish, 13–14 mm. long, tube about 5 mm. long, lobes obovate, acutish, about 9 mm. long, half as wide.

Junín: At the glacier Chuspicocha, Prov. Huancayo, 4,600 meters, *Weberbauer 6521*, type.

Gentiana chrysotaenia Gilg, Bot. Jahrb. 54: Beibl. 118: 39. 1916.

Showy perennial with yellow-striate fiery red flowers borne on many ascending-erect stems from a long fusiform root, the short caudex thickly covered with brown leaf remains; stems 7–10 cm. long, laxly leafy and always several-flowered; rosulate leaves oblong or obovate-oblong, narrowed to base, 5–7 cm. long, 8–12 mm. wide above to only 2 mm. wide at base, the more oblong cauline sessile, acute, to 2.5 cm. long, 5–6 mm. wide, all subcarnose; flowers in apical 3-flowered cymes and several from the upper leaf axils, the pedicels 2–3 cm. long; calyx tube obconic, finally about 4 mm. high and thick, the (in bud) lanceolate acute lobes at anthesis oblong, about 2 mm. wide at base, nearly 5 mm. long, the nerves prominent; corolla 18 mm. long, tube obconic-cylindric, a third as long, the rounded lobes 11 mm. long, 6 or 7 mm. wide.

Junín: Stony places, bush-grass formation, northeast of Huancayo, 4,100 meters, *Weberbauer 6528*, type.—Cuzco: In rocks, Pisac to Paucartambo, 4,000 meters, *Weberbauer 6914*.

Gentiana coccinea R. & P. ex G. Don, Gen. Syst. 4: 196. 1838; 54. *Selatium coccineum* G. Don, l.c.

Stems 1.5–3 dm. tall, ascending, branched, leafy; inflorescence subracemose; leaves linear-lanceolate, acute, veinless; pedicels nodding; calyx lobes ovate-lanceolate, acute; corolla red (Don).—My specimens are erect with appressed erect branches, leaves nearly free, subulate-linear, mostly about 17 mm. long, 2–3 mm. wide; flowers solitary in all the upper axils, more or less nutant on pedicels often 2 cm. long; calyx about 1 cm. long, nearly twice as long in fruit, lobes ovate, acuminate, half as long as tube; corolla finally about 17 mm. long, the oval lobes scarcely a third as long. The type has short sterile stems, no rosulate basal leaves. Flowers in my collection reddish-yellow. F.M. Neg. 29357.

Huánuco: Crevices of rock outcrop, San Carlos Mines, *2472* (det. Gilg). Without locality, *Ruiz & Pavón*, type.

Gentiana corallina Gilg, Repert. Nov. Sp. 2: 48. 1906; 54.

Affine *G. coccinea*, 2–3 dm. tall, with a solitary erect simple stem from a slender much-branched root, in type apparently annual; leaves all opposite, crowded toward base, 3–6 cm. distant above, coriaceous, free, linear, 2–2.5 cm. long, 2–2.5 mm. wide; flowers 3 at tip of stem or rarely solitary from the upper axils, often somewhat nodding pedicels 1–2 cm. long; calyx coriaceous, cupulate, 6 or 7 mm. long, the lanceolate acuminate lobes more than twice as long as tube; corolla 12 or 13 mm. long, the obovate rounded lobes little longer than the broadly obconic tube.—My specimen is more or less ligneous, the root rather stout and, if correctly placed, the species probably endures after the first year flowering and may be referable to *G. Dombeyana* Wedd. The aspect of type, however, is that of *G. graminea*. Flowers coral or brick red. F.M. Neg. 10297.

Amazonas: Above Balsas, Prov. Chachapoyas, *Weberbauer 4294*, type.—Huánuco: Chinche, above Yanahuanca, *1262* (det. Gilg).

Gentiana crassicaulis Gilg, Bot. Jahrb. 54: Beibl. 118: 60. 1916.

Stout-stemmed perennial, 4 dm. tall or more, the erect simple stems 7–8 mm. thick below inflorescence; basal leaves unknown but a separate sterile stem scarred by fallen leaves and bearing a rosette of erect oblong-lanceolate acute leaves, little narrowed below the middle, then dilated at base where connate for at least 1 cm., 11–13 cm. long, 13–14 mm. wide, fleshy-herbaceous, obviously 5-nerved, the nerves subimpressed; leaves of flowering stem similar but ovate-lanceolate, the uppermost nearly sessile, 3–5 cm. long, about 1.5 cm. wide, the lower cauline, 6–7 cm. long; flowers mostly nodding before anthesis in rather dense cymes at apex of stem and short branchlets, the bracts reduced; pedicels 1–2 cm. long; calyx 16 mm. long, campanulate tube 1 cm. long, 6–7 mm. wide, lobes lanceolate, acuminate, 6 mm. long, at base 2 mm. wide, nerves prominent; corolla 2–2.2 cm. long, the subcylindric tube 12 mm. long, 5–6 mm. thick, lobes rounded-obovate, 1 cm. long, 6 mm. wide.—As remarked by Gilg the relation of the sterile stem and the flowering is not known. F.M. Neg. 10299.

Peru (?): Without data, *Lobb*, type.

Gentiana crossolaema Wedd. Chloris And. 2: 55. 1859; 70.

Stems few, mostly fertile, erect or ascending, laxly leafy, 6–8 cm. high in the type, arising from a little crown clothed with dead rosette leaves, the lower spathulate-lanceolate; cauline leaves lanceolate or ovate-lanceolate, acute, the upper shorter than the internodes, not or scarcely connate at base, about 10 or 12 mm. long, 3–5 mm. wide, drying membranous; flowers solitary, suberect, about 18 mm. long, the pedicels as long or longer; calyx lobes lanceolate, acute, subequaling the tube; corolla pale blue, hardly a half longer than calyx, lobes elliptic-lanceolate, acute, fimbriae at throat equaling the tube, or about 4 mm. long, connate at base.—Type not seen.

Cuzco: In rocks, mountains separating Cuzco from the Valley of Santa Ana, (*Weddell*, type).

Gentiana cuspidata Griseb. Gent. 224. 1838; 44.

Stems ascending, the short sterile with laxly rosulate leaves, the solitary fertile, about 3 dm. tall, terminating in open corymbiform cyme; basal leaves linear-oblong, pseudopetiolate to base, mucronately acute, to 1 dm. long, 4–6 mm. wide, herbaceous, 1-nerved, marginally scabrous; cauline leaves few or nearly lacking, connate at base, mucronately acuminate, the pedicels greatly elongate; calyx lobes linear-lanceolate, acuminate, to three times longer than tube; corolla rotate, white, to about 2.5 cm.(?) long, the lobes obovate, acute.—After Grisebach. According to Weddell recalls *G. liniflora* HBK. from the aspect of the flowering stems, these with many elongate branchlets on the upper half that terminate in flowers to form an open corymbiform cyme; flowers 15–18 mm. long, the pedicels at least twice as long. Seems to be the same as *G. multicaulis*, i.e., *G. Pavonii*, and then the earlier name. F.M. Negs. 7621; 10302.

Lima: Wet places, Río Blanco, *3027* (det. Gilg).—Junín: Wet places, Cheuchin near Tarma, *Dombey*, type; *1063*. Rocky grass steppes, Huancayo, 3,500 meters, *Weberbauer 6599.* Empalme, *Killip & Smith 21772.*

Gentiana dianthoides HBK. Nov. Gen. & Sp. 3: 170, *pl. 223.* 1819; 61. *G. chelonoides* Willd. ex Roem. & Schult. Syst. 6: 185. 1820.

Ascending or erect, about 3 dm. tall or taller, the typically linear acute to acuminate, glabrous basally connate leaves about 2.5–3.5 cm. long, the lower subequaling the internodes, 3 mm. wide; flowers 4–6 (type), laxly pedicelled; pedicels about 1.5 cm. long or longer; calyx about 1 cm. long, the narrowly ovate-lanceolate acuminate lobes slightly longer than the tube; corolla to 3 cm. long, the ample subrotund lobes somewhat shorter than the tube.—Flowers in my *1811* greenish-pale yellow or pink. F.M. Neg. 37444.

Cajamarca: Mine Micuipampa to Cajamarca, 3,500 meters, *Bonpland,* type. Pass Coymolache, Hualgayoc, *Weberbauer 3953.* Near Hualgayoc, among shrubs, 3,400 meters, *Weberbauer 4909.*—Amazonas: Pacasmayo to Moyobamba, (*Stuebel 46*).—Huánuco: Mito, *1811* (det. Gilg, with query).—Ayacucho: Grass steppe, scattered shrubs, 3,700 meters, *Weberbauer 7594* (det. Gilg).

Gentiana dilatata Griseb. Gent. 222. 1838; 63. *G. primulifolia* Griseb. var. *dilatata* (Griseb.) Wedd. Chloris And. 2: 53. 1859.

Root stout; stems decumbent-ascending, 1 dm. tall, few-flowered, leafy below; leaves cartilaginous, oblong-spatulate, obtuse, 3–4 cm. long, 3 mm. wide at base, 5–6 mm. wide toward rounded apex, nerves finally 5, cauline 2.5 cm. long, spatulate-lanceolate, subattenuate and long and broadly semivaginate at base, subobtuse; peduncles mostly solitary, to 5 cm. long or twice as long as leaves; calyx long-campanulate, 12–16 mm. long, 6 mm. wide, the ovate-oblong rather acute lobes shorter than tube; corolla tube campanulate, lobes spreading; stamens included (after Grisebach).—Weddell considered this a robust variant of *G. primulifolia* with larger leaves, solitary or sub-umbellate flowers, ovate-lanceolate calyx lobes shorter than tube; indeed, both names probably refer to forms of *G. incurva.* Flowers greenish with violet lobes (Weberbauer); bluish or lilac (Stork & Horton). Type collection probably from Huancayo, since the Weberbauer is a perfect match (Gilg). Used as a blood and kidney medicine (Stork & Horton). F.M. Neg. 26811.

La Libertad: Edge of pond, Cachicadon, 2,700 meters, *Stork & Horton 9982.*—Junín: Brush margin, 4,000 meters, northeast of Huancayo, *Weberbauer 6529.* Without locality, high humid and frigid mountains, *Mathews*, type. "Corpus hui macho" (Stork & Horton).

Gentiana dissitifolia Griseb. Gent. 229. 1838; 60.

Strict, tall (several dm.), simple or shortly branched, laxly leafy, the internodes elongate; leaves linear-lanceolate, acuminate, scarcely or not connate at base, membranous, marginally scabrous, mostly 4–5 cm. long, 5–10 mm. wide; cymes more or less paniculate, pedicels, especially the lower, longer than the nodding flowers; calyx lobes lanceolate, acuminate, longer than tube; corolla blue, campanulate, 15–18 mm. long, the ovate lobes shorter than tube.—F.M. Negs. 7620; 10305.

Junín: Huasahuasi, *Dombey 394*, type.

Gentiana dolichopoda Gilg, Bot. Jahrb. 54: Beibl. 118: 36. 1916.

Perennial, the rather slender densely fibrous root bearing laxly rosulate leaves and several to many ascending-erect mostly 1-flowered stems 1–1.5 dm. long, remotely leafy below; basal leaves obovate-oblong, rounded at apex, gradually attenuate into a petiole-like base, this part to 2 cm. long, 1–1.5 mm. wide, the upper portion 1–1.5 cm. long, 6–7 mm. wide, the oblong or oblanceolate cauline leaves sometimes acutish, more or less narrowed to base, 1.5–2.5 cm. long, 3–6 mm. wide, all smooth, herbaceous; flowers whitish, bluish without, the pedicel 5–10 mm. long; calyx tube obconic, 3–4 mm. high, nearly as thick, the erect lanceolate acute lobes 4–5 mm. long, scarcely 2 mm. wide, obsoletely nerved; corolla 2–2.3 cm. long, the obconic tube 4–5 mm. long and thick, the obovate acutish lobes 15–18 mm. long, 5–6 mm. wide.—Included earlier by the author in *G. multicaulis* (Don) Gilg; nearly *G. sandiensis*, if separable; the calyx lobes and tube in type are subequal but former described as 5–7 mm. long. See also *G. peruviana*. F.M. Neg. 10306.

Ayacucho: Pampalca, *Killip & Smith 23246*.—Cuzco: Prov. Anta, (*Herrera 639*, det. Reimers). Prov. Paucartambo, (*Herrera 1038a*, det. Reimers). Sacsahuamán, *Vargas 141; 11100*. Near Cuzco, *Soukup 72; 196*.—Puno: Pucará, 3,700 meters, *Weberbauer 399*, type. "Pfalcha" (Vargas).

Gentiana Dombeyana Wedd. Chloris And. 2: 62. 1859; 46.

Somewhat suffrutescent, the slender stems annulate and prostrate at the leafless base, the mostly sterile densely leafy stems ascending, the flowering stems 2–4 dm. long; leaves linear or linear-lanceolate, acute or obtuse, shortly connate at base, barely 2 mm. wide, to about 2 cm. long, coriaceous, obscurely 1-nerved; flowers pedicellate, erect; calyx lobes narrowly lanceolate, acute, about as long as tube or longer; corolla 1–2 cm. long, deeply parted, the oblong-obovate lobes obtuse.—F.M. Neg. 10307.

Junín: Palcamayo, Cheuchin, Huasahuasi, *Dombey*, type.

Gentiana ericoides Griseb. Gent. 231. 1838. *Glyphospermum ornatum* G. Don, Gen. Syst. 4: 195. 1838.

Suffrutescent with erect virgate branches, the numerous spreading ovate acute leaves coriaceous, revolute, 5–6 mm. long, less than half as wide, lightly decurrent; flowers secund in a lax racemiform inflorescence 5–15 cm. long, the somewhat nutant pedicels 5–15 mm. long; calyx lobes lanceolate, acute, subequaling the campanulate tube; corolla subcylindric, 1 cm. long or slightly longer, the ovate subobtuse lobes shorter than the tube (after Grisebach).—Perhaps should be included in *G. violacea* as by Gilg, but flowers distinctly larger, and glabrous or nearly; the similarity was originally noted by Schlechter, who compared the specimens in the British Museum, according to Gilg, Bot. Jahrb. 22: 332. 1896.

Huánuco: Wet grass slope, northeast of Huánuco, *2170* (det. Gilg, *G. lavradioides*).—Junín: Vitoc, *Ruiz & Pavón*. Mount Portachella near Tarma, (*Mathews*, type). Cerro de Pasco, (*Lobb; McLean*, fide Weddell).

Gentiana ericothamna Gilg, Repert. Nov. Sp. 2: 50. 1906; 59.

Resembles *G. fruticulosa* and *G. violacea* but type with smaller flowers, ligneous, about 1.5 dm. high, simple below but with 5–8 erect-spreading branches densely floriferous apically, acutely tetragonous, the 4 costa scabrous-pilose; leaves linear, 7–10 mm. long, 1.5–2 mm. wide, acute, scarcely narrowed at sessile base, marginally scabrous-pilose; flowers forming a nearly flat corymb with many 1–5-flowered short branchlets; pedicels scarcely 2 mm. long; calyx short-campanulate, 4–5 mm. long, linear-lanceolate acute lobes much exceeding tube, marginally scabrous as the 10 striae; corolla about 7 mm. long, the obovate subacute lobes shorter than tube.—Seems to be near if not part of *G. radicata* Griseb. Flowers violet. F.M. Neg. 10309.

Huánuco: Mountain meadow southwest of Monzón, 3,400 meters, *Weberbauer 3381*, type.

Gentiana Ernesti Briquet, Candollea 4: 326. 1931.

Erect or ascending, branched above, to 4 dm. high, the lower internodes short, the upper elongate; rosulate basal lanceolate leaves marcescent, 4–5 cm. long, gradually long (to 4 cm.) -petioled, abruptly obtuse or subacute, the cauline attenuate to sessile base, 2–2.5 cm. long, to 4 mm. wide, all membranous; peduncles solitary (in type), apical, 2–9 cm. long, the flowers about 3 cm. long; calyx glabrous, the linear-lanceolate acuminate lobes at least as long as the campanulate tube, 1 cm. long; corolla tube to 1.5 cm. long, sparsely long-villous within, lobes about 1 cm. long, 6 mm. wide, oblong, obtuse. —Differs from *G. exacoides* Gilg, which has a thick caudex, subcoriaceous or fleshy leaves, rigid stems, corolla tube notably shorter than lobes, and calyx within at base with a crown of trichomes (Briquet); these, however, in the single flower of type number at Berlin examined, were not obvious. The presence of trichomes in calyx or corolla will probably in itself be found to be a variable character and not significant, as Reimers has suggested. F.M. Neg. 26812.

Cuzco: Near Cuzco, 3,500 to 3,600 meters, *Weberbauer 4870* (type, det. Ernest Gilg, *G. exacoides*). Rocky hill east of Cuzco, *Pennell 13700*? (flowers 2 or 3, calyx nearly glabrous).

Gentiana eurysepala Gilg, Bot. Jahrb. 50: Beibl. 111: 50. 1913; 27.

Perennial, 3–3.5 dm. high, the short erect caudex with a few rosulate erect leaves, these obovate-lanceolate, gradually narrowed to base, subrotund or rarely acutish at apex, 3-nerved, 3–4.5 cm. long, 1 cm. wide; cauline leaves lanceolate, little narrowed basally but sessile, subacute, to 4.5 cm. long, 7–8 mm. wide, smaller upward; flowers whitish, becoming yellow or rose-tinted, in a many-flowered subumbelliform apical cyme and also at the apex of 5–7 cm. long branches borne at intervals of 7–9 cm. in 3-flowered cymes; pedicels 1.5–6 cm. long, calyx to 1.5 cm. long, tube about 15 mm. long, 10-nerved, the 5 suboblong or somewhat ovate-lanceolate lobes minutely mucronate; corolla to 27 mm. long, obovate-rounded lobes to about 12 mm. long.—Related to *G. Bridgesii* Gilg (author); probably, but with usually 2–several cymes or 1 terminal, and solitary flowers in upper axils; it probably will be found to pass into *G. exacoides* or other related forms. Pale lavender petals red-striate; green sepals prominent (Stork & Horton).

Huancavelica: Grass steppes above Río Mantaro, 3,700 meters, *Weberbauer 5676*, type. Near Huancavelica, *Stork & Horton 10825* (det. Standley).

Gentiana exacoides Gilg, Bot. Jahrb. 22: 329. 1896; 76.

Caudex thick, type with few suberect rosulate leaves, flowering stem solitary, to 3 dm. tall, laxly leafy, erect, not or scarcely branched; leaves all lanceolate, acute, firm-membranous, the basal long-pseudo-petiolate, 6–10 cm. long, 6–11 mm. wide, cauline sometimes long-connate; flowers apical in 2–4-flowered cymes, erect, the pedicels 1.5–3 cm. long; calyx 13 or 14 mm. long, the narrowly lanceolate acuminate lobes longer than the tube, nerves prominent; corolla about 3 cm. long, the obconic tube sparsely pubescent, shorter than the oblong-obovate rounded lobes.—The calyx tube, according to Briquet, Candollea 4: 326. 1931, has a ring of trichomes within, these minute, however, in flower examined, if visible. I suspect also that the ecological background may affect the character of the leaves and that *G. Ernesti* and one or two other plants should be included here. Flowers lilac (Weberbauer); light violet or deep sea-foam green, the lobes lavender (Pennell). Reminded the author of *Exacum* L. of Asia and Africa. *Herrera 144* and *500a* from near Cuzco probably belong here (Reimers). F.M. Neg. 10311.

Cuzco: Near Cuzco, (*Herrera 48; 141; 153;* det. Reimers). Without data, *Ruiz & Pavón,* type; *Lobb.* Hill near Cuzco, *Weberbauer 4870* in part (as to Berlin specimen, det. Gilg). Acanacu, Prov. Paucartambo, Vargas *4/7072* (det. Standley). Sencca, *Vargas 498* (distr. as *G. sandienesis*). Valle del Urubamba, *Herrera 3454.* Paso de Tres Cruces, *Pennell 13895.* Pillahuata, *Pennell 14091.*

Gentiana foliosa HBK. Nov. Gen. & Sp. 3: 170. 1819; 41.

Type about 3 dm. tall with simple ascending tetragonous densely leafy stem and apically congested erect flowers; leaves rather fleshy, lustrous, opposite, lanceolate, acute, the cauline free or nearly, about 4–5 cm. long, 4–8 mm. wide; pedicels 1–1.5 cm. long; calyx campanulate, 10–12 mm. long, the lobes ovate-lanceolate, acute, about 5 mm. long; corolla nearly 2.5 cm. long, infundibuliform-campanulate, the obovate-oblong obtuse lobes clearly exceeding short tube; filaments glabrous.—*G. longibarbata* Gilg, 75, seems to be the same except for the barbate corolla throat; curiously enough, the type number seen has quite glabrous flowers! F.M. Neg. 10314.

Peru (probably). Ecuador.

Gentiana formosissima (Don) Gilg, Bot. Jahrb. 54: Beibl. 118: 54. 1916. *Eudoxia formosissima* G. Don, Gen. Syst. 4: 202. 1838. *E. pendula* G. Don?, l.c. *G. Herrediana* Raimondi ex Wedd. Chloris And. 2: 309. 1861. *G. magniflora* R. & P. ex Gilg, l.c. 22: 329. 1896.

More than a meter tall, the much-branched robust stem many-flowered; stem leaves opposite and subverticillate, oblong or oblong-lanceolate, acute, 3–7-nerved, free at base, 1–1.5 dm. long, 4 cm. wide, the uppermost much reduced; inflorescence laxly pyramidal, as many as 100 flowers borne on longer nodding pedicels, some from the leaf-axils, others subumbellate at branchlet tips; calyx 2.5–3 cm. long, the lanceolate acute lobes much longer than the tube; corolla deeply parted (rotate), sparsely barbate within at insertion of stamens, the flaring lobes obovate.—Seems it ought to be considered as possibly the earliest name for *G. regina* and *G. chamuchui;* if there is more than one species *G. pendula* ought to be taken into careful account. Endures several years, the stems below closely scarred by the fallen leaves (early internodes especially on sterile stems only a few mm. long), bearing only near the tip a thick head of larger fresh leaves; finally the stem may elongate (nodes becoming several cm. distant) into a handsome rather loose inflorescence of large (4–5 cm. long) flowers. Raimondi's name commemorated Cayetano Herredia, Dean of the Faculty of Medicine at Lima; description by Weddell from two lower branches of the panicle, this evidently about 3 dm. long. Flowers variously described as dark rose, purple, red and by myself as dull magenta. Illustrated, Hook. Icon. 10: *pl. 1962* (as *G. Herrediana*). F.M. Neg. 29358.

Ancash: Prov. Pataz, *Raimondi.*—Huánuco: Above Muña, 3,800 meters, *Weberbauer 6725; Pearce.* Wet rocky open uplands, Tambo de Vaca, *4348* (det. Gilg).

Gentiana fruticulosa Domb. ex Wedd. Chloris And. 2: 71. 1859; 59.

Stems many, ascending-erect, ligneous toward the leafless cicatrose base, densely leafy above, 3–4 dm. high, simple below but with several sterile branches above, the leaves of these imbricate, approximate on the fewer fertile stems, all subulate, shortly connate at base, very acute, fleshy, smooth, 1.5–2 cm. long, 1–1.5 mm. wide, spreading or recurving; inflorescences 4–5 cm. long, composed of 6–10 cernuous flowers binate in upper nodes, the pedicels shorter than the calyx, this with linear acute lobes little exceeding the tube, the corolla about 1.5 cm. long, scarcely a third longer, its oblong-lanceolate lobes subacute (after Weddell).—Flowers lilac (Weberbauer). F.M. Neg. 10315.

Junín: Huasahuasi, *Dombey,* type. West of Huacapistana, 3,500 meters, *Weberbauer 2227.*

Gentiana Gilgiana Reim. Bot. Jahrb. 62: 326. 1929.

Root thick, fusiform, the caudex branches nearly 2 cm. thick, covered with old leaves; rosette leaves dense, fleshy, rugulose, linear, usually 5–7 cm. long, 2.5–3 mm. wide, or finally dilated at the upper third (there to 5 mm. wide), obtuse, ovately vaginate and to 1 cm. wide at base, 1-nerved, cauline 2–3 pairs, linear except the uppermost ovate-lanceolate, dilated at nearly connate base, acutely acuminate; flowering stems erect, 1–2 dm. high, simple, with 1–3 erect flowers; peduncles 1–3 cm. long; calyx 3 cm. long, tube inflated-campanulate, 17 mm. long, narrowly lanceolate, very acute lobes slightly spreading, 13 mm. long; corolla subrotate, purple, 4.5–5 cm. long, tube about 2 cm. long, in sinus of filaments with 2 longitudinal brown lines, lobes ovate-oblong, rounded, about 3 cm. long and half as wide; stamens 3.5 cm. long; ovary stipe 1 cm. long.—Rather allied to *G. armerioides* but a distinctive type, the outstanding characters being the nearly linear leaves, large flowers and the habit, this suggesting that of some Iridaceae or Cyperaceae (author). The actual type at Berlin was destroyed.

La Libertad: In dense grass steppes and in limestone rocks, 4,400 to 4,700 meters, Huamachuco near Glacier Huaylillas, *Weberbauer 7011*, type; also, *Stork & Horton 9996* (det. Standley). "Yangamarsha" (Stork & Horton).

Gentiana Graebneriana Gilg, Bot. Jahrb. 54: Beibl. 118: 24. 1916.

Perennial, 6 dm. tall or taller, erect, the root little-branched, the rosulate leaves more or less marcescent, oblong- or obovate-lanceolate, acutish, narrowed (petiole-like) to base, 8–9 cm. long, 16 or 17 mm. wide, the lower cauline similar but smaller, the few upper oblong or ovate-oblong, acute, sessile, 4.5–6 cm. long, about 1.5 cm. wide, all herbaceous, and subequally 3-nerved, the other nerves five, parallel and often not conspicuous; flowers lilac, in many-flowered elongate cymes at apex of stems and branches, the pedicels filiform, to 2 cm. long, the phyllodiform bracts diminishing upward; calyx tube obconic-campanulate, 3.5–4 mm. high, the linear-lanceolate acute lobes 4.5–5 mm. long, about 1.5 mm. wide at base; corolla 1.5 cm. long, the obconic tube 4–5 mm. high, lobes obovate-oblong, acutish, 10 or 11 mm. long, 5–6 mm. wide.—Probably is *G. Lobbii*. F.M. Neg. 10319.

Piura: Grass steppes with scattered shrubs, 3,000 meters, west of Huancabamba, *Weberbauer 6051*, type.

Gentiana graminea HBK. Nov. Gen. & Sp. 3: 169. 1819; 45. *G. liniflora* Willd. ex Roem. & Schult. Syst. 6: 184. 1820.

Laxly cespitose, a few procumbent-ascending stems from each rosette, the sterile densely, the 1–3- or 5-flowered remotely leafy, much taller (1–4 dm.), the internodes 1–8 cm.; leaves all linear, acute, more or less connate basally, smooth, to 3.5 cm. long, 1–2 mm. wide; calyx lobes linear, acuminate, longer than the tube; corolla 2–2.5 cm. long in type, often shorter than pedicel, the lobes obovate-oblong (Weddell).—Bonpland observed the corolla as barbate; described by Kunth as nearly glabrous. The slender stems seem to be scarcely ligneous even at base when with 2–few ascending-erect somewhat quadrate branches, remotely leafy above. Probably is the earliest name for forms *pachystemon*, *oreosilene*, *fruticulosa*, and maybe one or two others. F.M. Neg. 10320.

Amazonas: In rocks, Micuipampa, *Bonpland*, type. Puna of Centamal and Cumullca and at Tampa de Centamal, *Stuebel 40; 37b.* Also at Cuzco, *Gay*, and puna of Carabaya, *Weddell*, according to the latter, this with 3–5 flowered stems, smaller flowers (1.5 cm. long).

Gentiana hebenstreidtioides Gilg, Bot. Jahrb. 54: Beibl. 118: 59. 1916.

Shrub, simple or nearly toward base, this about 5 mm. thick, above with a few or several elongating erect-spreading branches, often 3–4 dm. high, the younger tetragonous densely leafy portions and the pedicels—these 1–5 mm. long—minutely hispidulous or papillose-hispidulo-pilose; internodes rarely longer than 5 or 6 mm. with often short closely leafy branchlets in the upper axils; leaves narrowly ovate-oblong, broadly sessile, acute, subcoriaceous, 5–6 mm. long, 1–1.3 mm. wide; flowers in a pseudo-spike at end of principal branches composed of a number of short flowering branchlets; calyx about 4 mm. long, the campanulate tube 1.2 mm. long, narrowly lanceolate, acuminate lobes about 3 mm. long, obscurely papillose; corolla 7–8 mm. long, cylindric tube nearly 5 mm. long, 3 mm. thick, oblong-obovate acutish lobes 3 mm. long, 1.2–1.4 mm. wide.—Flowers violet (Weberbauer) or purple. This is doubtfully even a robust form of *G. violacea*.

Huánuco: Río Pozuzo valley, mossy places in grass steppe, 3,600 meters, *Weberbauer 6733*, type. Tambo de Vaca, mossy rocky upland, *4384* (det. Gilg).

Gentiana Herrerae Reim. Bot. Jahrb. 62: 330. 1929.

Root rather stout, fusiform; caudex to 2 cm. thick below the rosette, the remaining dried leaves few, the sterile rosette erect, 8–

10 cm. high, 10 cm. across, outer leaves recurving at apex, all broadly spatulate, rounded at apex, 6–8 cm. long, some 4 or 4.5 cm. wide above, nearly 2 cm. wide below, fleshy coriaceous; flowering stems about 2 dm. high, leaves (basal none) sessile, ovate to narrowly oblong, acute, the lower 6 cm. long, a third as wide; flowers many in leafy cymes, erect, 1.8–2 cm. long, peduncles 3–4 cm. long; calyx campanulate, membranous, the lanceolate very acute lobes equaling the tube; corolla apparently violet, tube yellow, 1 cm. long, ovate subacute lobes 7 mm. long, 4 mm. wide.—Type consisting of only two sterile rosettes and part of a flowering stem, this with at least 20 flowers; nevertheless, relationship probably with *G. dilatata*, with 2–5-flowered fertile stems (Reimers). F.M. Neg. 10322.

Cuzco: Jachacalla, Hacienda Ccapana, Prov. Juispicanchi, 3,900 to 4,200 meters, (*Herrera 287*, type). "Pfallchahuicontoi."

Gentiana hyssopifolia HBK. Nov. Gen. & Sp. 3: 172. 1819.

Erect, often simple below, more or less shortly branched above, about 2 dm. tall; leaves opposite, subconnate, rather approximate, linear, acute, glabrous, about 2 cm. long, rarely 2.5 cm. long, 2–3 mm. wide; flowers few, crowded at tip of stem and branches, erect, about 12 mm. long; pedicels to 6 mm. long; calyx lobes hardly 6 mm., the lanceolate acute lobes at least as long as tube; corolla lobes oblong, obtuse, somewhat longer than tube; filaments glabrous.—Habit of *G. coccinea* but otherwise apparently different, especially in the smaller, more congested flowers, in these respects similar to *G. radicata* Griseb. F.M. Neg. 10327.

Peru (probably). Ecuador.

Gentiana ignea Gilg, Repert. Nov. Sp. 2: 49. 1906; 70. *G. attenuata* (Don) Griseb. in DC. Prodr. 9: 93. 1845? *Selatium attenuatum* G. Don, Gen. Syst. 4: 196. 1838?

Slender fibrous-rooted annual, the simple erect stem to a meter tall; lower leaves densely crowded, the upper 8–14 cm. distant, all opposite, chartaceous, lanceolate, acuminate, gradually narrowed to base, free, evidently 7 (–9) -nerved, 4–10 cm. long, 8–10 mm. wide; flowers erect, the terminal 3 in lax cymes, pedicels 3–6 cm. long, often also solitary in the axils of intermediate leaves; calyx obconic, 11–14 mm. long, the dentiform ovate acuminate lobes about a third as long as tube; corolla 2.6–3 cm. long, the oblong subacute lobes about a third as long as the cylindric tube.—Flowers naturally fiery red;

the poor diagnosis of Don indicates at least a relationship of his unidentified species (Gilg); also allied by author to his *G. dolicantha*, Torreya 5: 109. 1905, of Bolivia with (ex char.) only 3–5-nerved leaves. Don's description is diverse in its linear-lanceolate leaves, angled peduncles, ovate-lanceolate calyx lobes, and subrotund corolla lobes. F.M. Neg. 10328.

Puno: Among dense tall grasses, 3,300 meters, near Sandía, *Weberbauer 746*, type. Without locality, *Soukup 1236*.

Gentiana incurva Hook. Bot. Misc. 2: 228. 1831; 38. *G. peduncularis* G. Don, Gen. Syst. 4: 181. 1838, not Willd., 1820. *Selatum incurvum* (Hook.) G. Don, l.c. 196. *G. flavido-flammea* Gilg, Repert. Nov. Sp. 2: 37. 1906.

Low stout-rooted perennial with a dense rosette of spathulate or oblong-lanceolate acute or obtusish leaves, long-narrowed to the dilated base, 4–9 cm. long, 8 mm. wide or wider, the obovate cauline smaller, and a number of flowering stems often a dm. or so long with 1 or 2–4 erect flowers on subumbellate pedicels 1–3 cm. long; calyx obconic, 13–17 mm. long, the ovate-lanceolate acute lobes about 6 mm. long, longer than the tube; corolla 2– nearly 3 cm. long, the elliptic-obovate acutish lobes much exceeding the obconic tube.—Synonyms after Gilg. Flowers yellow with fiery red tip (Weberbauer); clear yellow (my *1091*). F.M. Negs. 26815; 10367.

Junín: Cerro de Pasco, *Ruíz & Pavón; Mathews* (type, *G. flavido-flammea*). Near Yauli, 4,400 meters, *Weberbauer 343*. Hacienda Alpamina, 4,500 meters, *Weberbauer 5132*. San José, *1091* (det. Gilg). Mount La Juntay near Huancayo, *Killip & Smith 22103; 22038*.

Gentiana lavradioides Gilg, Repert. Nov. Sp. 2: 49. 1906; 59.

Nearly *G. violacea* but, according to the author, the stems manifestly 4-alate above instead of merely acutely 4-angled, erect, above the middle densely branched, the erect branches sparsely and shortly branched; leaves ericoid, opposite, 2–6 mm. distant, coriaceous, free, narrowly ovate, acute, rounded or often subcordate at the shortly or broadly pseudopetiolate base, 7–9 mm. long, 3–4 mm. wide; flowers solitary at tips of branches, in axils of leaves or often on short (to 1 cm. long) sparsely leafy branchlets, all forming pseudo-racemes toward the tips of the branches, 4–7 cm. long; pedicels 4–6 mm. long; calyx cupulate, 4–6 mm. long, the lanceolate acute lobes as long as or slightly longer than the tube; corolla 13 or 14 mm. long, the ovate subacute lobes about a third as long as the little ampliated cylindric tube.—Almost certainly a part of *G. ericoides* Griseb. but type of that not seen; however, the latter was referred by Gilg to *G. violacea* with flowers only half as long. Flowers scarlet. F.M. Neg. 10334.

Junín: Among scattered shrubs west of Huacapistana, 3,400 meters, *Weberbauer 2249*, type.—Huánuco: Wet grassy slope, northeast of Huánuco, *2170* (det. Gilg).

Gentiana lilacina Gilg, Repert. Nov. Sp. 2: 40. 1906; 45.

Resembles *G. graminea* and *G. tristicha* but stouter-stemmed and type 6-verticillate (lower verticils about 7 mm. distant, the upper 3–7 cm.), linear, 3–5 cm. long, 2–3 mm. wide, acuminate, 8–12 mm. vaginate at base; flowers many, the uppermost solitary, pedicels 2–5 cm. long; calyx obconic, 11–13 mm. long, the linear-lanceolate acuminate lobes somewhat longer than tube; corolla about 2.5 to nearly 3 cm. long, the obovate rounded lobes exceeding tube.—Flowers lilac color. F.M. Neg. 10335.

Ancash: Open places between shrubs, 3,200 meters, *Weberbauer 3223*, type. "Sajhuacache."

Gentiana limoselloides HBK. Nov. Gen. & Sp. 3: 167, *pl. 220.* 1819; 35. *G. peduncularis* Willd. ex Roem. & Schult. Syst. 6: 185. 1820, fide Gilg. *G. limoselloides* HBK. var. *tubulosa* DC. Prodr. 9: 87. 1845.

Type 5–7.5 cm. high with procumbent-erect slightly branched quadrate stems, opposite petioled spathulate leaves and terminal solitary flowers; leaves obtuse, about 12 mm. long, 2–3 mm. wide, rather thick; peduncles 12–16 mm. long; calyx campanulate, the acute lanceolate lobes about as long as the tube; corolla about 1 cm. long, white but with 5 spots in throat, the obovate-oblong obtuse lobes subequaling the obconic tube.—According to Gilg's description the petiole scarcely equals the blade, the oblong cauline leaves obtuse, the calyx lobes longer than the tube, and not in Peru in typical form; Weddell included a specimen by Ruíz and Pavón without data; it is certainly the basic name for a group of similar plants which will probably be shown to constitute one somewhat variable species.

Lima: Río Blanco, *788; Killip & Smith 21738; 21762.* Ecuador.

Gentiana liniflora HBK. Nov. Gen. & Sp. 3: 171. 1819; 76. *G. floribunda* Willd. ex Roem. & Schult. Syst. 6: 185. 1820. *G. coerulea* R. & P. ex Griseb. Gent. 235. 1838.

Biennial, the root to about 3 mm. thick, the short rather slender caudex with a few dried leaves and leaf-bases and an erect sometimes basally solitary stem, the lower nodes crowded, some greatly elongated; leaves herbaceous, subequally 3-nerved, the lowest more or less obovate-lanceolate, acute, long-attenuate to the broadly sessile base, 3–6 cm. long, several to 7 mm. wide or some wider, the similar cauline ovate-oblong, to about 3 cm. long and a cm. wide or wider, acute or subobtuse; flowers at tip of stems and branchlets in dense cymes or corymbs, the pedicels 8–14 mm. long; calyx tube campanulate, 3–3.5 mm. long, lanceolate lobes acute-acuminate, 2.5 mm. long, about 1.5 mm. wide; corolla (terminal, lateral always much smaller) to 2.2 cm. long, obconic tube to 6 mm. long, obovate-oblong lobes to 13 or 15 mm. long, 7–9 mm. wide, with a few trichomes above the base or (and) below the sinuses, the stamens dilated below.—After Gilg, who calls attention to the differences in size of corolla from above to below in each cyme and on the branchlets, the smallest only 12 mm. long, the lobes 4–5 mm. wide. Flowers violet or roseate. Probably should include *G. Graebneriana, G. Lobbii* and *G. stricticaulis*, the few trichomes in corolla doubtfully a constant character. F.M. Neg. 10339.

Piura: Ayavaca, 2,730 meters, *Bonpland*, type. Northwest of Huancabamba, 3,200 meters, *Weberbauer 6324; 6322a; 6330* (all det. Gilg).

Gentiana Lobbii Gilg, Bot. Jahrb. 54: Beibl. 118: 60. 1916.

Slender probably simple-stemmed perennial about 4 dm. tall, 3 mm. thick above base, the upper internodes 5–7 cm. long (basal unknown); cauline leaves opposite, herbaceous, the lower oblanceolate, acute, narrowed to sessile slightly connate base, 5–7 cm. long, 9–11 mm. wide, the similar upper ovate-lanceolate, 2.5–4 cm. long, 10–13 mm. wide; flowers mostly nodding before anthesis, borne in close cymes at tip of stem and branchlets, the leafy bracts reduced upward; pedicels 5–9 mm. long; calyx about 9 mm. long, tube campanulate-cylindric, 4 mm. long, 3 mm. across, equaled by the very acute lanceolate lobes, nerves obsolete; corolla 14 mm. long, subcylindric tube half as long, 3 mm. wide, the ovate-oblong acutish lobes 7 mm. long, 4 mm. wide.—Type specimen in early anthesis, the pedicels and flowers probably longer, corolla lobes and tube perhaps subequal. Without basal leaves and with undeveloped inflorescence character certainly dubious; strange, indeed, that botanists feel themselves obligated or wish to describe imperfect scraps, a common puerile procedure in every herbarium; may be with *G. stricticaulis* a part of *G. liniflora*. F.M. Neg. 10341.

Huánuco: Andes of Pillao, *Lobb*, type. Yanahuanca, *1162* (det. Gilg *G. dianthoides* but merely acute leaves not connate!).

Gentiana lobelioides Gilg, Bot. Jahrb. 54: Beibl. 118: 30. 1916.

Small or diminutive acaulescent perennial, the leaf-rosette 1.5–2 cm. across; leaves fleshy, oblong or obovate-lanceolate, somewhat narrowed to base, subrotund at tip, 7–10 mm. long, about 3 mm. wide; flowers pale blue, erect, always solitary, the 1–6 slender peduncles leafless unless near base, short or 10–17 mm. long; calyx campanulate, 7–8 mm. long, tube 4–5 mm. long, lobes obovate, rounded as those of corolla, this 11 mm. long, its obconic tube about 6 mm. long, subequaled by the stamens, the nectar glands in the lower part small, brown.—Included by Gilg (Repert. Nov. Sp. 2: 34. 1906) in *G. peruviana*, to which certainly it is very nearly related; Gilg's key distinction—corolla 16–17 mm. long—would seem to any good gardener a reward for his intelligent (and loving) care. Nature on occasion may accomplish as much and here the lower elevation may conceivably have been a factor; and in biennial species, as in *G. liniflora*, difference in flower size has been observed. F.M. Neg. 10342.

Puno: In open polster plant mats, 4,600 meters, Poto to Ananea, Prov. Sandía, *Weberbauer 955*, type.

Gentiana longibarbata Gilg, Bot. Jahrb. 22: 331. 1896; 75.

Stems fleshy-indurate, the flowering (others unknown) to 5 dm. tall, leafless toward base, densely but laxly leafy above, the ovate-lanceolate acute somewhat or scarcely basally connate leaves 3–5 cm. long, 10–14 mm. wide, reduced upward, rigid-chartaceous; flowers 5–8 in an apical cyme, the more or less nutant pedicels 14–18 mm. long, the broadly campanulate calyx 14 mm. long, its lanceolate-acuminate lobes slightly longer than the tube; corolla in type greenish-yellow, densely long-barbate in the throat, 2.5 to nearly 3 cm. long, the broadly obovate lobes rounded; nectaries strongly marked. —The plant forms small candelabra-type bushes 5–6 dm. high, the blossoms green-gold; habit of *G. foliosa* HBK. but distinguished especially by the barbate corolla (Gilg). The Peruvian specimen had blue flowers.

Huánuco: Tambo de Vaca, *Woytkowski 141?* Without locality, *Ruíz & Pavón*, fide Gilg. Ecuador.

Gentiana luridoviolacea Gilg, Repert. Nov. Sp. 2: 37. 1906; 32.

Habit of the related *G. scarlatina;* rosulate fleshy leaves obovate-lanceolate, acutish, petiole-narrowed, 14–16 mm. long, 3–4 mm. wide, the 2–4 leaves on the lower part of the flowering stems smaller; flowers solitary; calyx shortly campanulate or subpatelliform, 4 or 5 mm. long, the broadly ovate mucronately acutish lobes scarcely as long as the tube; corolla 11 or 12 mm. long, the obovate-lanceolate subacute lobes twice as long as the obconic tube.—Name of course refers to flower color as noted by collector, written originally with hyphen; corollas of my specimen were brown-black edged with yellow-green. The corolla lobes are not much longer than the tube in my *3064*, marginally minutely papillose. F.M. Neg. 10344.

Junín: Grassy limestone slope, Cerro de Pasco, *3064* (det. Gilg). At 4,500 meters above Lima, *Weberbauer 3759*, type. Morococha, *886* (det. Gilg, *G. calcarea*).

Gentiana luteomarginata Reim. Bot. Jahrb. 62: 332. 1929.

Low (type to 4 cm. high with flowers) perennial, the rather stout root branched and fibrous; rosette leaves subcoriaceous, oblong, 5–8 mm. long, 2–3 mm. wide, rounded at apex, attenuate to very short petiole, the 2–10 erect flowers from their axils, when full grown about 2 cm. long, peduncles about 2 cm. long; calyx broadly campanulate, membranous-coriaceous, tube pellucid-coerulescent equaled by the ovate subacute lobes; corolla about 18 mm. long or longer, the obovate lobes (6 mm. wide) nearly three times longer than tube; yellow trichomes of filaments below rather numerous.—Nearest to *G. persquarrosa* Reim.; corolla pale blue with fine blue lines, the tube yellow within, the upper part of lobes on one side greenish-blue, within below oblong spot of greenish blue and toward lower margins a yellow line (Reimers). Seems probably to be a color form of *G. primuloides* Gilg in spite of the few trichomes within the corolla. F.M. Neg. 10345.

Cuzco: Hacienda Churu, Prov. Paucartambo, 3,700 meters, *Herrera 1036*, type. Valle del Apurímac, *Herrera 2129*. "Azul-ppallcha."

Gentiana mesembrianthemoides Gilg, Repert. Nov. Sp. 2: 41. 1906; 45.

Habit of *G. graminea* and allies; stems in type mostly fertile, a few loosely rosulate with basal linear acutish leaves (not at all dilated at base), 5–8 cm. long, 3 mm. wide, all rather fleshy, opposite but, as cauline, 6–9 mm. connate, the latter 4–6 cm. distant, slightly ovate at base, above linear-lanceolate, acute, dilated at base; flowers solitary or usually 2–3 in the upper axils, peduncles 4–5 cm., pedicels 1–2 cm. long; calyx tubular, 10–12 mm. long, the linear-lanceolate acuminate lobes about two-thirds as long at full anthesis; corolla 22–24 mm. long, the obovate rounded lobes longer than the short tube.—Flowers white or lilac. F.M. Neg. 10353.

Ancash: Bunch grass formation, above Poto, Prov. Huari, 4,200 meters, *Weberbauer 3303*, type.

Gentiana Meyeniana Griseb. Gent. 217. 1838; 30.

Diminutive, densely cespitose, the short (to 1 cm.) stems 1-flowered; leaves cartilaginous, oblong-linear, obtuse, to about 5 mm. long, 3 mm. wide; flowers sessile or shortly peduncled, erect, to 18 mm. long; calyx campanulate, the broadly ovate-oblong obtuse lobes and tube subequal; corolla lobes ovate-oblong, equaling the tube.—Quite the facies of *G. saxicola* Griseb. but all parts about half as large, leaves proportionately or little larger. Weddell (after the author) has inadvertently written "flowers 7 or 8 mm. long," an error copied by Gilg; flowers originally described as 18 mm. long. Concealed among grasses (Meyen). The related *G. boliviana* Pax from near La Paz has corolla more than 1 cm. long, calyx tube and lobes subequal.

Puno: Lake Titicaca, 4,300 meters, *Meyen*, type.

Gentiana muscoides Gilg, Repert. Nov. Sp. 2: 35. 1906; 49.

Cespitose perennial with many prostrate stems (often sterile) forming mats often 1–1.5 dm. across, 1.5–2.5 cm. high, the fleshy apically crowded leaves obovate, gradually pseudopetiolate, 7–11 mm. long, 2–3 mm. wide toward the rounded tip; flowers always solitary on pedicels only 1–2 mm. long; calyx campanulate-obconic, 7–8 mm. long, the broadly obovate lobes longer than the tube; corolla 11–12 mm. long, the broadly rounded lobes 7–8 mm. long, tube 3–4 mm. long; stamens well-exceeding throat.—Originally allied by author to *G. peruviana;* probably ought to be drawn to include *G. lobelioides*, if the apparent differences between the types are variable. Flowers red-lilac. F.M. Neg. 10355.

Lima: At foot of Yanasinga Glacier, 4,600 meters, *Weberbauer 96*, type.

Gentiana nitida Griseb. Gent. 216. 1838; 70.

Laxly cespitose with short ascending flowering stems 2–3 cm. long; leaves linear-lanceolate, obtuse or subacute, 2–3 mm. vaginate at base, 1.5–2 cm. long, 2–3 mm. wide, coriaceous, lustrous; flowers shortly peduncled, erect; calyx campanulate, the triangular lobes much shorter than the tube; corolla about 1.5 cm. long (or longer), long-barbate in the throat, the rotund lobes shorter than the tube. —Corolla in my *2164* to 22 mm. long. Flowers rose-colored or pale lavender (Griseb.); yellow or salmon-tipped (*1098*); pink with white beard(*1938*). Type not seen but I have no doubt that the Weberbauer specimen belongs to the species, since it agrees with Weddell's good description (Gilg). Illustrated, Gilg, Bot. Jahrb. 54: Beibl. 118: 73, *figs. A–D* (flower). F.M. Neg. 31873 (Lobb).

Huánuco: Boggy hilltop, *2164*. Grassy uplands, *Mito, 1938*.—Junín: Cerro de Pasco, (*Cruickshanks*, type). San José, *1098*. In puna of polster and rosette plants, Comas, Prov. Jauja, *Weberbauer 6601*. Without locality, *Lobb*, fide Gilg. Near Lake Junín, *Verne Grant 7571*.

Gentiana persquarrosa Reim. Bot. Jahrb. 62: 332. 1929.

Root rather slender, fibrous, the terminal rosette of lax and small leaves mostly dried at flowering time of the many basally decumbent squarrose-spreading stems, erect only above, 3–12 cm. long, partly 1-flowered, mostly branched, and with 1–several secondary flowers from axils of cauline leaves; sterile stems none; rosulate leaves oblong, attenuate to very short petiole, apically subrotund, about 1 cm. long, 4 mm. wide, membranous, the sessile cauline obovate-oblong, acute, 3–7 mm. long, 1.5–3 mm. wide, variable, approximate to remote; peduncles 2–8, mostly 6 cm. long, the terminal flowers 12–15 mm. long, the lateral smaller, shorter peduncled, all erect; calyx membranous, campanulate, about 6 mm. long, pellucid tube coerulescent, the tube and obovate rounded lobes subequal; corolla apparently whitish (or yellowish) within at insertion of filaments with several whitish trichomes, the obovate rounded lobes 4 mm. wide, twice as long as tube, within toward the throat with a large medial blue-green(?) spot.—Except for the trichomes in corolla this seems to me to be allied to several species in the smooth corolla section, as *G. sandiensis* Gilg, *G. tarapacana* Gilg, and *G. limoselloides* HBK., suggesting, with the weak development of the corolla trichomes, that the division of the genus into "Imberbes" and "Barbatae" may not indicate correctly the natural relationship; in Gilg's key it is nearest *G. cerastioides* HBK. of Ecuador (Reimers). The author's remarks are certainly to the point; it is doubtful, too, if the fimbriate species are all allied, as similar trichomes are developed less or not at all in species otherwise nearly matching. *Pennell 13754* with calyx lobes even broader and glabrous corolla "dusty orient blue shading to bluish white" probably belongs here.

Cuzco: Hacienda Ccapana, Prov. Guispicauchi, Río Paucartambo, 3,700 meters, (*Herrera 1020*, type). Cerro de Colquipata, 4,800 meters, *Pennell 13754?*

Gentiana oreosilene Gilg, Repert. Nov. Sp. 2: 40. 1906; 53.

Slender-stemmed, more or less suffrutescent toward base suggesting habit of *G. pachystemon;* branches few, elongate, 2–3 dm. tall, terminating in a pseudo-racemose inflorescence, the flowers 1 (or 2) in all the upper axils on slender pedicels 1–2 cm. long; lower leaves 3–6, upper 3–3.5 cm. distant, all opposite, about 1.5–2.5 cm. long, 2 mm. wide, not at all connate at base, acute; calyx shortly cupulate, about 9 mm. long, the lanceolate-linear acuminate lobes to three times longer than tube; corolla 15–17 mm. long, the obovate subacute lobes more than twice as long as the obconic-cylindric tube. Flowers pale lilac, violet-veined (type); bright or red-purple.—F.M. Neg. 10359.

Amazonas: Above Balsas, 3,400 meters, *Weberbauer 4288*, type.—Huánuco: Grass shrub slope, Mito, *1623; 1892* (both det. Gilg). Southeast of Huánuco, *2120* (det. Gilg). Without data, *Sawada 90.*

Gentiana pachystemon Gilg, Bot. Jahrb. 54: Beibl. 118: 46. 1916.

Perennial, the slender ascending-erect stems about 2 dm. high, more or less densely leafy toward base and in type with also an erect closely leafy stem 6 or 7 cm. high; leaves all equal, opposite, linear, broadly sessile at base, acute, 1.5–2 cm. long, about 1.5 mm. wide, chartaceous or subcoriaceous, smooth except for sparsely cartilaginous-serrulate margins; flowers laxly disposed in 3's at tip and in upper axils to form a pseudo-raceme, the pedicels 1–1.5 cm. long; calyx tube conspicuously 10-striate, campanulate, about 3 mm. long, 4–5 mm. thick, the lanceolate acute lobes 4–5 mm. long, 2 mm. wide at base, chartaceous, lustrous; corolla 15–17 mm. long, tube 3–4 mm. long, nearly as broad, the oblong acute lobes 11 or 12 mm. long, half as wide.—Habitally it resembles *G. saxifragoides* HBK. to which I once referred it, but it is strongly differentiated floristically (Gilg); that, as to type, has calyx tube finely striate and terminal flowers longer than 2 cm.—differences, of course, that may be found variable; in fact, Gilg included it in the HBK. species without question in his earliest work. F.M. Neg. 10361.

Amazonas: Calle-Calle, 3,600 meters, Pacasmayo to Moyobamba, *Stuebel 51; 52,* types.

Gentiana paludicola Gilg, Repert. Nov. Sp. 2: 42. 1906; 35.

Resembles *G. limoselloides* but the narrowly spatulate rosulate leaves with the petiolulate portion (3–3.5 cm. long, 0.75 mm. wide) two or three times longer than the blade, this 12–14 mm. long, 3–4 mm. wide, the cauline lanceolate, acute, 1–2 cm. long; flowers mostly solitary, rarely a few in the upper leaf axils, the pedicels 3.5–6 cm. long; calyx narrowly campanulate, 8 or 9 mm. long, the narrowly lanceolate acuminate lobes half again as long; corolla 13–15 mm. long, the obovate lobes nearly three times longer than the tube.—The validity of the species on the basis of the relatively long petiole and acute instead of obtuse cauline leaves is certainly open to question; however, it seems to approach *G. cuspidata.* Probably is a healthy state of *G. limoselloides,* to which the Grant and Pennell specimens could be referred; cf. also *G. cuspidata.* F.M. Neg. 10364.

Ancash: Wet puna, 3,500 meters, Prov. Cajatambo, *Weberbauer 2694,* type.—Junín: Cobracancha Valley, *Verne Grant 7536.*—Cuzco: Saxaihuamán, *Pennell 13582* (det. Gilg, *G. sandiensis*).—Puno: Grassy meadow on puna, Chuquibambillo, 3,900 meters, *Pennell 13420* (det. Gilg).

Gentiana Pavonii Griseb. in DC. Prodr. 9: 94. 1845. *G. multicaulis* (Don) Gilg, Bot. Jahrb. 22: 306, 315. 1896; 44, not Gillies, ex Griseb. Gent. 225. 1838. *Selatium multicaulis* G. Don, Gen. Syst. 4: 196. 1838.

Root elongate; stems many, cespitose, filiform, ascending; leaves aggregate below, petiolate, spathulate, the cauline linear-lanceolate, acute, scabrous-margined; peduncles terminal, mostly solitary; calyx turbinate, the lanceolate mucronate lobes longer than the tube; corolla infundibuliform, deeply lobed, the elliptic lobes connivent.—F.M. Neg. 26819.

Junín: Tarma, (*Ruiz &*) *Pavón,* type.

Gentiana pernettyoides Reim. Bot. Jahrb. 62: 328. 1929.

Suffrutescent, to 4 dm. high, the erect blackish stems to 3 mm. thick, usually simple to about the middle, finally with 5–8 spreading branches, all little longer than the primary stem, the internodes 5–10 mm. long; leaves (basal none) appressed, rigid-coriaceous, acute, broadly dilated to the shortly connate base, the lower part about

4 mm. long, half as wide, the upper spreading portion broadly oblong, 8–12 mm. long, 4–5 mm. wide; flowers spreading or horizontal, solitary or rarely geminate in upper axils or 2–3 on short branchlets forming a terminal rather dense subracemose inflorescence 4–8 cm. long, pedicels 5–10 mm. long; calyx broadly campanulate, coriaceous, transversely rugose, 8 mm. long, the very acute lanceolate lobes as long as the tube; corolla fiery red, broadly campanulate, 12 mm. long, tube 5 mm. long, lobes rounded, 7 mm. long, 4 mm. wide; stamens 7 mm. long; ovary sessile.—Evidently nearest *G. Engleri* Gilg (*G. radicata* of Peru) of southern Colombia with smaller leaves and shortly pedicellate larger terminal flowers (Reimers).

La Libertad: Grass steppe, 4,000 meters, Valley of the Mixiollo, Prov. Pataz, *Weberbauer 7026*, type.

Gentiana peruviana (Griseb.) Gilg, Bot. Jahrb. 22: 304. 1896; 30. *G. limoselloides* HBK., var. *peruviana* Griseb. Gent. 215. 1838.

Type only 2–4 cm. tall with the solitary flowers, these 2 cm. long; root or caudex simple or sparsely branched with a rosette of rather few fleshy-coriaceous pseudopetiolate oblanceolate leaves 7–12 mm. long, 2–4 mm. wide, obtuse or subobtuse; peduncle 5–12 mm. long; calyx campanulate, 10–12 mm. long, the broadly oblong apically rounded lobes about half as long; corolla lobes somewhat shorter than obconic tube, broadly obovate, rounded, to 6 mm. wide; stamens submedially inverted, about half as long as the corolla.—The sterile rosette may be from a decumbent-ascending branch. *G. dolichopoda* apparently should be included here, as a variety defined on the basis of the solitary stems, oblong-spatulate definitely obtuse calyx lobes, and corolla 18–20 mm. long; it perhaps might, according to Weddell, constitute a distinct species, which idea Gilg supported with his name as authority. F.M. Neg. 10369.

Lima: Huariaca, *3121*.—Huánuco: Chusqui, *1952*. Yanashallas, *2483*.—Junín: Tarma, *1048*. La Quinua, *2004*. Yauli, *926*. Chinchi, *1261*. Cerro de Pasco, *Grant 7542*.—Cuzco: La Raja, *Pennell 13496* (young state?). Cerro de Colquipata, *Pennell 13754*.

Gentiana petrophila Gilg, Repert. Nov. Sp. 2: 42. 1916; 35.

Resembles *G. limoselloides* but type distinguished by the fleshy coriaceous leaves and calyx; stems 1–3 (for each rosette), spreading-erect, simple, a few cm. high; basal leaves narrowly oblanceolate or nearly linear, acute, petiole-like base 3–6 mm. long, blade-like portion 1–1.5 cm. long, the several but remote cauline opposite, lanceolate, not at all connate at base; flowers mostly 2–3, occasionally solitary or also with one from a lower leaf axil, pedicels 1.5–3.5 cm. long; calyx obconic, 8 or 9 mm. long, lanceolate lobes acuminate, half again as long as the tube; corolla 16 or 17 mm. long, the narrowly obovate often subsetose lobes about four times longer than the stout cylindric tube.—Root in type thick, fusiform with simple caudex or crowned, in my specimen, with several rosettes. Flowers white to pale violet; in my specimen the buds were reddish, the flowers white within. F.M. Neg. 10370.

Junín: Stony places, 3,700 meters, *Weberbauer 2562*, type. Grassy stony slopes, Chasqui, *3298* (det. Gilg). Near Huancayo, *Killip & Smith 22032.*

Gentiana pinifolia R. & P. ex G. Don, Gen. Syst. 4: 182. 1838. *Pitygentias pinifolia* (R. & P.) Gilg, Bot. Jahrb. 54: Beibl. 118: 90. 1916.

Stem 1.5 dm. tall, simple, erect, densely leafy, terminated by a thyrsoid raceme; leaves very narrowly linear, mucronulate, crowded; flowers erect; calyx lobes lanceolate, acute; corolla tube exceeding calyx, glabrous within, the ovate lobes acute.—Seems in all probability to be a form of *G. thyrsoidea.* Illustrated, Field & Garden, Sert. Pl. 1: *pl. 58.* F.M. Neg. 29364.

Ancash: In mats of polster and rosette plants, Prov. Cajatambo, to Passe Chonta, 4,400 meters, *Weberbauer 2799.* Prov. Huari, west of Pichiu, 3,800 meters, *Weberbauer 2931.* Stony slope at glacier Yanasinga above Lima, (*Weberbauer 5191*). Without locality, *Ruiz & Pavón,* type.

Gentiana poculifera Gilg, Bot. Jahrb. 50: Beibl. 111: 48. 1913; 31.

Perennial, root rather stout, multicipital caudex with many dense leaf rosettes and flowering stems, these erect-spreading, 8–10 cm. long; basal leaves herbaceous, faintly 3-nerved, oblong, gradually narrowed to 1 cm. long petioles, acute, 1–1.5 cm. long, 4 mm. wide, the few sessile oblanceolate cauline 7–8 mm. long, 2–3 mm. wide; flowers roseate, mostly solitary at apex of slender branches sparsely leafy toward base, the pedicel 5–6 cm. long; campanulate calyx tube in fruit 12–13 mm. high, 6 mm. broad, obsoletely 10-nerved, lobes to 4 or 5 mm. long and nearly as wide, ovate, acute; corolla about 1.5 cm. high, tube about as long as calyx tube, lobes oblanceolate, acute.—Material poor but evidently species is allied to *G. tubulosa,* i.e.

G. carneorubra. Calyx (not quite full anthesis) has suboblong mucronately acute lobes about as long as tube (5 mm.), corolla about 1.5 cm. long (described by Gilg as 2.5 cm. long).

Junín: East of Palca, 3,500 meters, *Weberbauer* (no number), type.

Gentiana porphyrantha Gilg, Repert. Nov. Sp. 2: 39. 1906; 31.

Rather coarse fleshy-leaved perennial, the few-flowered stems a dm. tall or taller; lower leaves apparently openly rosulate or few, oblanceolate, subrounded at tip, long-narrowed to base, 2–3 cm. long, 2–3 mm. wide, the smaller cauline narrowly oblong, not or scarcely narrowed to base, acute; flowers usually 2–3 in the upper axil, the pedicels 1.5–2.5 cm. long; calyx subcampanulate, coriaceous, about 9 mm. long, the ovate-lanceolate acutish lobes little shorter than the tube; corolla about 21 mm. long, the apically rounded broadly obovate lobes nearly three times longer than the tube.—Possibly *G. primulifolia* has been misinterpreted and the specimens cited by me under that name may belong here. Flowers scarlet red. F.M. Neg. 10373.

Ancash: Above Chiquian, Prov. Cajatambo, 4,400 to 4,600 meters, *Weberbauer 2803*, type.

Gentiana potamophila Gilg, Bot. Jahrb. 54: Beibl. 118: 74. 1916.

Delicate perennial with slender root and stem, this simple or with one or two branches, only a few cm. to 1 dm. tall, the few rosulate and cauline leaves equal, oblanceolate, acutish, long-attenuate and not at all connate to base, thin-herbaceous, opaque, 3–5-nerved, 1.5–2 cm. long, 2.5–3.5 mm. wide; flowers solitary at stem and branchlet tips, the peduncle 3–4.5 cm. long; calyx 10–12 mm. long, tube obconic, 5.5–6.5 mm. long, the oblanceolate subobtuse lobes 4.5–5.5 mm. long, 2 mm. wide, nerves obsolete; corolla 18–20 mm. long, obconic tube 7–8 mm. long, 5 mm. across at top, ovate-rounded lobes 11 or 12 mm. long, 5–6 mm. wide; stamens dilated, densely ciliate on the lower third.—The calyx lobes, it seems to me, are obtuse as illustrated, Gilg, l.c. 73, E–J (calyx and flower), but in the Cuzco specimens, which could be *G. dolichopoda* except for the pilosity in corolla, they are acutish. F.M. Neg. 10374.

Apurímac: Andahuaylas, *Stork & Horton 10733.*—Cuzco: On Pisac Trail, *Pennell 13698.*—Arequipa: Along brook in puna, 3,900 meters, south of Sumbay, *Weberbauer 6907*, type.

Gentiana primulifolia Griseb. Gent. 221. 1838; 32.

Cespitose, the mostly fertile erect-ascending stems from a slender caudex clothed with parts of dried leaves, laxly leafy below only, 1–3-flowered, 5–12 cm. high; lower leaves often rosulate, spatulate or obovate, obtuse, obviously 3-nerved, petioled, 2–5 cm. long, 5–15 mm. wide, the 2–4 pairs of cauline ones elliptic-oblong, 1–2 cm. long, slightly connate, scarcely coriaceous; pedicels about 2.5 cm. long; calyx lobes ovate, acute, subsquarrosely spreading, equaling the tube (Grisebach); corolla tube little stouter than lobes.—The species may be variable and Weddell correct in including here *G. dilatata;* however, Gilg wrote "characteristic for this often misdetermined species is the large calyx, 11–12 mm. long, the lobes half as long while the blossoms at most attain 1.5 cm.," but in the type the flowers obviously are not fully grown; see also *G. porphyrantha.* The Weddell illustration, Chloris And. 2: *pl. 52a,* is rather *G. primuloides* Gilg. Corolla half orange-red, half yellow (Stork); scarlet (Killip & Smith). F.M. Neg. 10375.

Lima: Río Blanco, *668; Killip & Smith 21611.* Matucana, *368.*—Junín: Huancayo to Pariahuanca, (*Mathews 853,* type). Acopulca to Pariahuanca in puna grass, *Stork 10931* (det. Standley, *G. scarlatina*).

Gentiana primuloides Gilg, Bot. Jahrb. 54: Beibl. 118: 31. 1916.

Perennial (or flowering as a biennial), the root finally fusiform, the basal leaves rosulate, spathulate-oblanceolate, narrowed to base, more or less rounded at tip, 12–24 mm. long, 3–4 mm. wide, the sessile cauline oblong or ovate-oblong, little if at all connate, to 1 cm. long, 3–4 mm. wide, often rather thick; flowers usually solitary, rarely 1 or 2 from the upper leaf-axils, the many stems 2–5 cm. tall, often pedunculiform and leafless, the pedicels (or peduncles) 1.5–3 cm. long; calyx campanulate, 8–10 mm. long, lobes ovate, even broadly shortly acute, 5–7 mm. long, 2.5–3 mm. wide; corolla finally about 2 cm. long, the obovate lobes nearly three times as long as the short tube.—Corolla orange or "igneous" but the covered part of the convolute lobes in the Lechler specimen are evidently white or pale red (Gilg); in my collection, yellow, red-tipped; caudex to 4 cm. long and densely clothed with leaf-bases; flowers 1–3. Illustrated, Weddell, Chloris And. *pl. 52A* (as *G. primulifolia* Griseb.). F.M. Negs. 10407; 26825.

Junín: Limestone cliffs, La Oroya, *935.*—Cuzco: Paucartambo, 3,800 meters, (*Herrera 378,* det. Reimers); *Weberbauer 6914; Herrera 1082; 1054; 1007; 2389.* Canas y Chumlivilcas, 4,200 meters, *Vargas*

912; 934. La Raya, *Pennell 13506.*—Puno: On the mountains near Agapata, *Lechler 2002,* det. Weddell, Grisebach, *G. vaginalis.* Prurillo, *Soukup 843.* Bolivia. "Puca-" or "ckello-pfallcha" (Herrera); "sucullullu" (Vargas); "jallo-jallo."

Gentiana pseudolycopodium Gilg, Repert. Nov. Sp. 2: 38. 1906; 52.

Bushy, mostly branched from the base, 3–4 dm. tall, the imbricate approximate leaves obovate-rhombic, decurrent on stem but little narrowed to base, acute, 4–6 mm. long and nearly as wide, coriaceous, opaque; flowers in dense apical cymes; calyx narrowly campanulate, 3–4 mm. long, the tube evidently surpassed by the lanceolate acute lobes; corolla about 9 mm. long, the ovate-oblong lobes much longer than the obconic tube.—Well-named; a half-shrub with yellowish flowers; near *G. fastigiata* Benth. of Ecuador with rigid lustrous appressed leaves, dark red flowers. F.M. Neg. 10377.

Huánuco: Grass-shrub formation on mountain southwest of Monzón, 3,400 meters, *Weberbauer 3353,* type.

Gentiana punicea Wedd. Chloris And. 2: 70. 1859; 69.

Root stout with a multicipital caudex (with dead leaves), several curved-erect densely leafy sterile stems about 1.5 dm. long and several fertile ones, laxly leafy above, to 3 dm. tall including the loose pseudo-raceme, this with a terminal 3-flowered cyme, the axillary branchlets mostly 1-flowered; leaves all 5-nerved, fleshy herbaceous, lanceolate, acutely and shortly acuminate, not or scarcely narrowed or connate at the broadly sessile base, 5–7 cm. long, 5 mm. wide, gradually decreased above to about 2.5 cm. long, 4–5 mm. wide; pedicels 1–1.5 cm. long, calyx 1 cm. long, nerves prominent, campanulate tube 6 mm. long to 5 mm. across, lanceolate acute-acuminate lobes 4 mm. long, 1.5 mm. wide at base; corolla finally about 2 cm. long, obconic-cylindric tube 14 mm. long, 5 mm. thick, oblongish lobes 5 or 6 mm. long, 3–4 mm. wide.—No doubt the name refers to the color of the flowers; description after Gilg, who has noted that (in his opinion) the Mandon specimen referred here by Weddell from Bolivia concerns a different species; according to the author the leaves are 3-nerved. F.M. Neg. 10380.

Puno: Prov. Carabaya, 4,000 meters, (*Weddell,* type). Bolivia?

Gentiana radicata Griseb. Gent. 229. 1838; 51. *G. Barbeyana* Gilg, Bot. Jahrb. 22: 310. 1896, fide Gilg.

Numerous diffuse stems and slender rhizomes, leafless above the base, this more or less covered with bases of fallen leaves, densely leafy above, 1–2 dm. high, the inflorescence of 5–6 flowers shortly subracemose or corymbose; leaves lanceolate-linear, 1–1.5 cm. long, about 1–2 mm. wide, revolute, acute; calyx 8–9 mm. long, the lobes linear, very acute, longer than tube; corolla about 1.5 cm. long, described as yellow, the lobes oblong-lanceolate but rounded apically. —My specimen was composed of nearly a dozen branches from near base, these approximately or subfastigiately branched 4–5 cm. higher, the numerous branchlets erect and so crowded as to form a subglobose plant 2 or 3 dm. in diameter. Flowers white, dark-veined (my *4368*). F.M. Neg. 10382.

Huánuco: Mossy rocky uplands, Tambo de Vaca, *4368* (det. Gilg). —Junín: Vitoc, *Ruiz & Pavón* (type, *G. Barbeyana*). In mountains above Lima, (*Lobb*); *Ruiz & Pavón*, type.

Gentiana Raimondiana Wedd. Chloris And. 2: 310. 1861; 63.

Stems described as slender, many, all floriferous, ascending or suberect, 3 dm. tall or taller, with a number of elongate branches; cauline leaves mostly longer than the nodes (basal unknown), medial about 6 cm. long, 4 mm. wide, opposite, linear or subspatulate (upper linear-lanceolate, much shorter), subacute, 1-nerved, vaginate-connate for several mm. at base; branchlets mostly 3-flowered at apex; flowers 15–18 mm. long, shorter than the pedicels; calyx lobes triangular-lanceolate, acute, scarcely longer than the ample tube; corolla obovate, the subrotund lobes about equaling the tube.—With *G. bicolor* Wedd. (see *G. Stuebelii* Gilg) intermediate to the rotate and tubular corolla species (Weddell). Not seen by Gilg, who allied it to *G. Steubelii*. The soft or fistulose stems of the Dahlem specimen were 5 mm. thick, base unknown. F.M. Neg. 10383.

Cajamarca(?): Shore of Lake Yahuarcocha, Cajabamba, 4,000 meters, *Raimondi*, type.

Gentiana regina Gilg, Notizbl. Bot. Gart. Berlin 7: 509. 1921.

Robust, the stout fusiform root with caudex several cm. thick, solitary erect flowering stem sometimes more than a meter tall, floriferous from base (about 3 cm. thick) to apex with numerous showy lilac (blue-lilac-reddish) laxly pedicelled flowers, the lower in cymes, the upper solitary in the axils of the 4-verticillate sessile ovate leaves; lower internodes about 3, uppermost 6 or 7 cm. long; sterile stems none; basal leaves in a dense rosette about a dm. across, oblong-lanceolate, acute, attenuate to base (this about 2.5 cm. wide), to 2.5 dm. long, 7–8 cm. broad, upper gradually reduced from about 18 mm. long, 5 cm. wide, all fleshy coriaceous with 7–9 parallel nerves; pedicels mostly 6–10 cm. long, often somewhat nutant; calyx 2.5 cm. long, campanulate tube 1 cm. long, 1.5–2 cm. in diameter, the lanceolate acute lobes 1.5 cm. long, 5 mm. wide at base; corolla finally 4–4.5 cm. long, campanulate tube only about 1 cm. long; the obovate oblong lobes broadly rounded, 2 cm. wide or wider; filaments dilated basally and accompanied by many long fasciculately united trichomes. —Magnificent species which Weberbauer has described in detail in the original publication of Gilg, l.c. 510–511; perhaps his most salient field observations refer to the stem as web-like and watery within and the probable conclusion of the life history with the growth (after several years preparations) of the flower stalk, this in full bloom, in the type, in January, 1920. F.M. Neg. 10384.

Ancash: On limestone, Mount Huacchara, Cordillera de Pelagatos, 4,350–4,600 meters, *Weberbauer 7244*, type. "Challegando."

Gentiana roseolilacina Gilg, Repert. Nov. Sp. 2: 35. 1906; 34.

Low perennial with slender fusiform root, the many densely crowded branches and fleshy leaves prostrate; leaves lanceolate, acute, dilated at base, 1.5–2 cm. long, 2.5–4 mm. wide, the cauline 7–11 mm. long, 1.2–5 mm. wide; flowers solitary, the peduncle-like usually leafless stem 2–5 cm. long, sometimes with 1 or 2 flowers near the base; calyx narrowly campanulate, 10-striate, 7–9 mm. long, about equaled by the lanceolate acute lobes; corolla 15–17 mm. long, obovate acutish lobes little longer than the obconic-cylindric tube.—Name written with hyphen by author, who suggested relationship with his *G. Hieronymi*, i.e. *G. peruviana* (Griseb.) Gilg, sens. lat. F.M. Neg. 10386.

Ancash: In stony places, 4,000 meters, above Lake Querococha, Prov. Huaraz, *Weberbauer 2952*, type.

Gentiana rupicola HBK. Nov. Gen. & Sp. 3: 167, *pl. 220*. 1819; 77.

Low (a few cm. high in type) with many procumbent short densely leafy branches, sometimes one or more elongating; leaves glabrous, rather fleshy, opposite, sessile, spathulate or oblong, obtuse, usually 4–8 mm. long, often scarcely 2 mm. wide or occasionally about 12 mm. long, 3 mm. wide; flowers apical, solitary, subsessile, erect, 1.5 to nearly 2 cm. long; calyx about 8 mm. long, the lanceolate subacute lobes about as long as the tube; corolla barbate in throat, subcampanulate, lobes obovate-oblong, obtuse, exceeding tube; filaments glabrous.—Varies in size of leaves and flowers (Kunth). Habit of *G. alborosea* et cetera but otherwise quite distinct; flowers variously described as lilac or roseate to purple; widely distributed in Ecuador; to be looked for in adjacent Peru at high altitudes. F.M. Neg. 10387.

Peru (probably). Ecuador.

Gentiana sanctorum Gilg, Repert. Nov. Sp. 2: 41. 1906; 25.

Tall perennial, the stem below flowering portion (base unknown) about 1 cm. thick; leaves 4–6-verticillate (4–6 cm. distant), on branchlets opposite, lanceolate, acutish, not at all narrowed and not connate at base, 4–7 cm. long, 5–8 mm. wide, fleshy-coriaceous, 3–5 nerved; flowers solitary or often 2–3 in the upper axils, forming a beautiful narrow many-flowered corymb; calyx campanulate, 13 or 14 mm. long, the lanceolate acuminate lobes longer than the tube; corolla scarcely twice as long (22–31 mm.), the obovate-oblong rounded lobes 5 or 6 times longer than the very short tube.—Nearly *G. verticillata* but the flowers larger—terminal 3–3.2 cm. long, lateral finally 2.5 cm. long, while those of Weddell's plant were described as 1.5–1.8 cm. long; habit no doubt similar to that of *G. verticillata* (Gilg). The handsome flowering plants are used to adorn crosses and holy pictures (Weberbauer). The type was a gift to Weberbauer, not showing the base or habit. However, in all probability it is a well-developed state of Weddell's species, whose name, "*verticillata,*" had been used in the genus. F.M. Neg. 10389.

Ancash: Huaraz, above 4,000 meters, *Weberbauer 2959,* type. "Okemakaschka."

Gentiana sandiensis Gilg, Repert. Nov. Sp. 2: 36. 1906; 33.

Acaulescent (type) little annual or perennial with a very slender fusiform root, a more or less dense rosette of lanceolate or linear-lanceolate acutish leaves—these dilated at base, fleshy, 11–13 mm. long, 1.5–3 mm. wide, the sterile cauline much smaller—and solitary flowers on erect-spreading peduncle-like leafless stems 1.5–4 cm. tall; calyx campanulate, obsoletely 10-striate, the lanceolate acutish lobes to about two-thirds as long as the tube (type) or as long; corolla 13–14 mm. long, obovate acutish lobes about twice as long as tube. —Flowers white, with violet or green veins or exterior band, tube often yellow. The Weberbauer specimens (except type and *917a*) were included (maybe rightly) by Gilg, l.c. 34, in *G. limoselloides* HBK. (Gilg) of Ecuador with the remark that they were typical examples! However, he later accepted as a specific character calyx lobes shorter than tube. F.M. Neg. 10390.

Junín: Yauli, *Weberbauer 352.* La Oroya, *Weberbauer 12593.* Cerro de Pasco, *Poeppig.*—Huancavelica: Wet grassland, *Stork & Horton 10255* (distr. as *G. multicaulis*).—Cuzco: Near Cuzco, 3,500 meters, (*Herrera 19c,* det. Reimers). Wet *Distichia* moor, La Raya, *Pennell 13489.* Cerro de Colquipata, *Pennell 13750.*—Puno: Above Cuyocuyo, 3,600 meters, *Weberbauer 917a.* Pucará, 3,700 meters, *Weberbauer 445.* Near Suchez, Bolivian boundary, *Weberbauer 1016,* type. Bolivia.

Gentiana saxicola Griseb. Gent. 216. 1838; 33.

Densely cespitose, the root stout with a 1-flowered stem about 3 cm. high, peduncle about 5 mm. long, sterile stems about 1 cm. high; leaves cartilaginous, marginally asperous, broadly oblong (or basal spathulate-obovate), subacute or subobtuse, not vaginate, 4–8 mm. long, about 1 mm. wide; calyx turbinate, the ovate subacute recurving lobes equaling the tube; corolla about 1.5 cm. long, the lobes 1 cm. long, 6 mm. wide.—Corolla (dried) red-violet. Leaves are narrower in the Grant specimen. F.M. Neg. 31874.

Junín: Cerro de Pasco to Junín, *Mathews,* type. Near Lake Junín, *Verne Grant 7572.*

Gentiana saxifragoides HBK. Nov. Gen. & Sp. 3: 168. 1819; 48.

Cespitose, with procumbent-ascending basally indurated stems, the densely leafy sterile a few cm., the fertile 1.5–2 dm. tall, these remotely leafy above, finally leafless at base; leaves opposite, narrowly lanceolate, or sublinear, subfleshy, papillose-margined, obtuse, 8–18 mm. long, to 2.5 mm. wide; flowers 1 to 3, rarely several, blue-violet, the apical 2 cm. long; pedicels 2.5–3.5 cm. long; calyx campanulate, 1.5 cm. long, the lanceolate lobes acute, about 1 cm. long; corolla lobes subequaling the tube, obovate-oblong, subobtuse; filaments glabrous.—Flowers bright violet-blue (Bonpland) or wine color with purple striations (Stork & Horton). On barren rocks or in shrubwood, in poor clusters or with over a hundred flowering stems (Woytkowski). F.M. Neg. 10391.

Huancavelica: Acobamba, 3,500–4,000 meters, *Woytkowski 70.* East of Surcubamba, 3,000 meters, *Stork & Horton 10389.* Ecuador.

Gentiana scarlatina Gilg, Repert. Nov. Sp. 2: 36. 1906; 34.

Acaulescent perennial from a fusiform root, the caudex clothed with dead dilated leaf bases and a rosette of lanceolate subacute fleshy leaves 2–3 cm. long (type), or longer, 3–4 mm. wide, the few (and lower) cauline smaller; flowers solitary (type) on 4–7 cm. long curved ascending peduncle-like stems; calyx campanulate, 8 or 9 mm. high, obsoletely striate, the lanceolate acute lobes about as long as or slightly longer than the tube; corolla 17–19 mm. long, the obovate lobes evidently larger than the tube.—Affine *G. primulifolia* Griseb. (Gilg), but seemingly rather a part of *G. primuloides.*

Plant used in respiratory treatment, as for pneumonia.

Puno: Poto, Prov. Sandía, *Weberbauer 1047*, type. "Jallu-jallu" (Weberbauer).

Gentiana scarlatiflora Gilg, Bot. Jahrb. 50: Beibl. 111: 49. 1913; 62.

Erect glabrous annual, the slender strict quadrate solitary stem 4–5 dm. high from a lax rosette, the short branches from the remote nodes (about 1 dm. distant) not exceeding the flowers; leaves all opposite with upper 4-verticillate, the lower pseudopetiolate, all lanceolate, acute, to 3.5 cm. long, 7–8 mm. wide, not or scarcely connate at base; flowers scarlet, in 7–12-flowered cymes at apex of stems or the cymes at tip of branchlets 3-flowered; pedicels slender, erect, 1–4 cm. long; calyx narrowly campanulate or obconic, tube 10-nerved, 5–6 mm. high, 3–4 mm. broad at top, the lanceolate acute lobes 4–5 mm. long; corolla about 2 cm. long, 5-parted, the suborbicular lobes less than one third as long as the gradually enlarged tube. —Nearest *G. lilacina* Gilg (author). F.M. Neg. 10392.

Apurímac: Above Lake Pacucha, Andahuaylas, 3,200 meters, *Weberbauer 5836*, type.—Cuzco: *Herrera 2589.* Hacienda Ayusbamba, *Vargas 858.* "Puca-pfalcha."

Gentiana scarlatinostriata Gilg, Bot. Jahrb. 54: Beibl. 118: 67. 1916.

Caudex stout, 4–5 cm. thick, densely covered with old leaves and 2–4 rosettes of fleshy erect obscurely nerved oblong-lanceolate acuminate leaves little narrowed to the broadly sessile base, 8–10 cm. long, 2–2.5 cm. wide, the rather ovate stem leaves gradually reduced, vaginate at base; flowers somewhat nodding, apparently always solitary in each axil, even the terminal, forming an open pseudo-raceme, the pedicels 2.5–3 cm. long; calyx about 17 mm. long, tube obconic-cylindric, 1 cm. long, 7 mm. across at apex, the lanceolate acuminate lobes 7 mm. long, 2 mm. wide at base, nerves obsolete; corolla 3.5–4 cm. long, the subcylindric tube about 18 mm. long, 7–8 mm. wide above, the ovate-subrotund lobes as long, 11 or 12 mm. long.—Flowers scarlet without, yellow within with scarlet longitudinal lines; a beautiful and distinctive species.

Junín: In detritus of a glacier, 4,400 meters above Hacienda Runatulla, northeast of Comas, Prov. Jauja, *Weberbauer 6621*, type. "Chunchuhuaita."

Gentiana sedifolia HBK. Nov. Gen. & Sp. 3: 173, *pl. 225*. 1819;
5. *G. prostrata* Haenke, Jacq. Coll. 2: 66, *pl. 17*. 1788, as to Peru.

Cespitose, low (usually about 2.5–5 cm. high), the creeping stems with sterile and fertile densely leafy suberect branches; leaves glabrous, oblong-lanceolate, subconnate and more or less imbricate, rather fleshy, acute, usually 4–6 mm. long, scarcely 1 mm. wide; flowers sessile, terminal, solitary, about 1.5 cm. long, often blue and green with darker stripes, throat dotted, the short spreading limb plicate, 5 lobes longer than the intermediate ones; calyx lobes much shorter than the tube, narrowly lineolate, acute, diaphanous-margined; filaments linear, glabrous; anthers oblong, arcuate; stigma lobes elongate, revolute.—After HBK. Grisebach (as recently Kusnezow) kept both species, considering the plant of Haenke as annual; however, from the large series collected by Weberbauer and his own observations it is evident that in Peru the plant flowers all year, some individuals being annual. Either one variable species is concerned or several, as Weberbauer and myself believe to be the case; at present it is preferred to consider *G. prostrata* as a widely spread species of the northern hemisphere (Gilg). Reimers, Bot. Jahrb. 62: 323. 1929, noted a Bolivian specimen only 1.5 cm. high, 1 pair of leaves, flowers 5–7 mm. long. Variants that probably are only ecological states (suggesting that a number of species based on similar characters will be shown to be the same) include var. *elongata* Griseb. Gent. 270. 1838, lax leaves linear, spreading and its subvar. *imbricata* (Griseb.) Wedd. l.c. 73, similar but short and compact; var. *compacta* Griseb. l.c., similar to the subvariety but leaves ovate, acute. Color of flowers is usually yellow (tube) and lobes blue with dark dots or lines at base, or white and green or pale blue.

La Libertad: Above Cachicaclan, 2,100 meters, *Stork & Horton 9988* (det. Standley).—Lima: Wet *Distichia* moor, Cerro Colorado, *Pennell 14682*. Casapalca, *858*. Cheuchin, *Ruiz & Pavón*. Río

Blanco, *791*.—Huánuco: Mossy rocky uplands, Tambo de Vaca, *4374*. Mito, *1648; 1850*. Northeast of Huánuco, *2184*.—Junín: Cerro de Pasco, (Hall, type, var. *elongata*). Alpine region, (*Mathews*, type, var. *compacta*). Cobracancha Valley, 4,200 meters, *Verne Grant 7543; 7545*.—Huancavelica: Dry sandy loam, Salcabamba, 3,300 meters, *Stork & Horton 10292* (det. Standley). Wet pampas, *Stork & Horton 10256* (det. Standley).—Ayacucho: Near Huanta, *Killip & Smith 22193*.—Apurímac: Open place in forest, *Goodspeed Exped. 10623* (det. Standley).—Cuzco: In mats, 3,200 meters, Huasao, Prov. Guispicanchi, (*Herrera 517*, det. Reimers). Pampa de Anta, *Vargas 142*. Cerro de Colquipata, *Pennell 13752; 13753*. Prov. Paucartambo, *Vargas 304; Herrera 3360*. La Raya, *Pennell 13486*. Saxaihuamán, *Herrera 1528; 1393; Pennell 13590*. Cerro de Cusilluyoc, *Pennell 13867*.—Arequipa: Wet swale, Vinococaya, *Pennell 13342*.—Puno: Chuquibambilla, *Pennell 13418; 13426*. Near Puno, 4,000 meters, *Soukup 98*. Bolivia to Colombia. "Ppenccacuc" (Herrera); "penga-penga."

Gentiana setipes Gilg, Bot. Jahrb. 54: Beibl. 118: 43. 1916.

Perennial, the rather stout root little-branched with short caudex clothed with marcescent leaves and many laxly leafy erect stems often 1.5–3 dm. high; basal leaves obovate-lanceolate, long, cuneate-narrowed to base, acute, 3.5–4 cm. long, 7–8 mm. wide, the cauline ovate, somewhat acute, broadly sessile, 2–2.5 cm. long, about 1 cm. wide, the many lateral nerves more or less obsolete; flowers roseate in subumbelliform cymes (rarely solitary at tip of lateral branchlets), the filiform pedicels 1.5–4.5 cm. long, rarely nodding, the leafy bracts little reduced; calyx tube campanulate, densely black pubescent within at base, 2.5 mm. long, the ovate-lanceolate lobes acute, 4–5 mm. long, 2.5 mm. wide at base; corolla about 18 mm. long, tube obconic, 5–6 mm. long, lobes obovate-rounded, 12 mm. long, 8 or 9 mm. wide. —The Pennell specimen seen is meager; the calyx trichomes noted are small and few; however, the character of the species may not be stabilized. F.M. Neg. 10393.

Piura: Grass steppes northwest of Huancabamba, 3,200 meters, *Weberbauer 6322*, type.—Cuzco: Grassy knolls, Cerro de Cusilluyoc, *Pennell 13812* (det. Gilg with query).

Gentiana speciosissima Gilg, Bot. Jahrb. 22: 325. 1896; 41.

Stout perennial root crowned with a dense rosette of rigid-coriaceous narrow leaves and a simple solitary laxly leafy stem sometimes

5 dm. tall; leaves all narrowly lanceolate, long-acuminate but obtusely calloused, semiamplexicaul at base, concave above, strongly convex beneath, those of the rosette 3–3.5 cm. long, 3–4 mm. wide, the lower cauline 4–4.5 cm. long, 5 or 6 mm. wide, gradually reduced upward; flowers in a beautiful panicle 1–2.5 dm. long, more or less nutant on pedicels 1.5–2.5 cm. long; calyx 13 or 14 mm. long, the narrowly lanceolate acuminate lobes about 1 cm. long; corolla 2–2.5 cm. long, obconic tube much shorter than the obovate rounded lobes; disk-like nectar pits concave, conspicuous.—Blossoms pale lilac (Weberbauer). F.M. Neg. 10395.

Amazonas: Pacasmayo to Moyobamba, 3,300 meters, *Stuebel 246*, type. Grass steppes east of Chachapoyas, 2,800 meters, *Weberbauer 4412*. Top of La Yalca near Chachapoyas, *Williams 7577*. Ventilla to Bagazán, *Stuebel 25*.

Gentiana stricticaulis Gilg, Bot. Jahrb. 54: Beibl. 118: 62. 1916.

Perennial from a fibrous root, the incomplete type specimen with a stem decumbent, at base more or less marked by leaf-remains and with a sterile leafy offshoot, the flowering stems 2 or more, at least 3 dm. tall, the internodes long; basal leaves crowded, lanceolate-obovate, cuneate to base, acute, 3–4 cm. long, 4 mm. wide, the cauline broadly sessile, ovate, acute, 1.5–2 cm. long, 4–6 mm. wide, all fleshy herbaceous; flowers crowded at apex of stems and one or two branchlets, the pedicels 1.5–2.5 cm. long, the bracts little reduced; calyx tube campanulate, 3–4 mm. long, lanceolate lobes acuminate, 4–5 mm. long; corolla 15–17 mm. long, obconic tube 6–7 mm. long, lobes broadly obovate, acutish, 8–10 mm. long, 5–6 mm. wide.—Notwithstanding the fact that the corolla lobes are longer than the tube I have allied this to *G. Stuebelii* since it has the same habit and inflorescence (Gilg). Possibly a part of *G. Lobbii*.

Piura: Grass steppes with scattered shrubs, 3,300 meters, east of Huancabamba, *Weberbauer 6097*, type.

Gentiana Stuebelii Gilg, Bot. Jahrb. 22: 317. 1896; 62. *G. bicolor* Wedd. Chloris And. 2: 310. 1861?

Biennial or perennial with many basal rosulate linear leaves (3–5 cm. long, 2–3 mm. wide) and a flowering stem or stems in type branched from base; stem leaves similar, not amplexicaul, acute, 2–3 cm. long, 2–4 mm. wide; flowers in a panicle of cymes at tip of stems and branches, pedicels 2–3 cm. long; calyx 13–15 mm. long, the linear acuminate lobes about as long as the tube; corolla 2.5 to nearly 3 cm. long, the oblong rounded lobes and tube subequal.—Variable in habit, stems erect, 2.5 dm. tall, or curved-ascending, to 5 dm. high, suggesting *G. umbellata* but corolla not pubescent within (Gilg). *G. bicolor* described as very tall, erect, branches many with two pairs of small leaves and few short-pedicelled flowers beneath the terminal; stem leaves linear-lanceolate, narrowly acuminate, free at base, 3-nerved, about 3 cm. long, much shorter than the internodes; flowers to 5, erect, 2 cm. long; calyx lobes linear-lanceolate, acuminate, exceeding the tube; corolla subinfundibuliform, the oblong-elliptic subacute lobes about equaling the tube. *G. Dielsiana* Gilg, l.c. 316, from near La Paz, Bolivia, has longer broader stem leaves, corollas to 3.5 cm. long. Flowers violet or lilac (Weberbauer), many in racemiform inflorescences. F.M. Negs. 10280 (*G. bicolor*); 10400.

Cajamarca: Shrub formation, San Miguel, 3,000 meters, *Weberbauer 3926*. Near Hualgayoc, 3,500 meters, *Weberbauer 3994*. Shore of Lake Yahmarcocha, Cajabamba, 4,200 meters, *Raimondi* (type, *G. bicolor*).—Amazonas: Celendín, *Stuebel 35j*, type.—La Libertad: Cachicadam, *Stork & Horton 9983* (maybe; no base).

Gentiana thyrsoidea Hook. Bot. Misc. 2: 227. 1831. *Pitygentias thyrsoidea* (Hook.) Gilg, Bot. Jahrb. 54: Beibl. 118: 91. 1916. *Selatium thyrsoideum* (Hook.) G. Don, Gen. Syst. 4: 196. 1838. *G. tupa* Gilg, l.c. 22: 333. 1896.

Stout stem marked by vaginate leaf bases, to 2 cm. thick, 3 dm. tall or taller; leaves verticillate, crowded, 6–8 cm. long, 3–4 mm. wide, the imbricated cauline often vaginate for 6–8 mm., the lower broadly so, reflexing, all linear-lanceolate, 4–7 cm. long, 4–5 mm. wide; inflorescence many-flowered, leafy, densely racemiform, 1–1.5 dm. long, 5–6 cm. thick; calyx 17–20 mm. long, the lobes linear- or ovate-lanceolate, acute, scarcely or clearly shorter than the tube; flowers solitary in the verticillate axis, longer than pedicels, these 1.5–2 cm. long, the subcampanulate or subtubular corolla 1.5–2 cm. long or longer with ovate acute lobes much shorter than the tube.—This is possibly a vigorous state resulting from more favorable conditions; in my specimen the flowers were pale greenish-yellow. Corolla described by Weddell as glabrous but keyed by him as barbate within! Corollas examined glabrous; *Weberbauer 7494* with ligulate rosulate leaves to 5 or 6 cm. long, 7–9 mm. wide, inflorescence 5–8 cm. long, seems to be a young state. Apparently Gilg based his genus *Pity-*

gentias on the presence of 5 callouses forming a nectariferous annulus above the corolla-base, also at the base about the short stipe of the ovary; there is much morphological variation within the corolla in *Gentiana;* sometimes nectary glands are obsolete, again conspicuous or pubescent; Gilg himself described them as scarcely prominent in his *G. tupa.* F.M. Neg. 29365.

Huánuco: Mossy bog, *1937* (det. Gilg, *G. pinifolia*).—Junín: Diezmo, *Ruíz & Pavón.* Huallay near Cerro de Pasco, (*Cruickshanks,* type). Grassy granitic slope, San José, *1099* (det. Gilg).—Ayacucho: Mt. Razuhuillca, 4,500 meters, *Weberbauer 7490* (det. Gilg); *7494* (det. Gilg, *G. incurva?*).

Gentiana trichostemma Wedd. Chloris And. 2: 56. 1859; 70.

Facies of *G. graminea,* the slender diffuse laxly leafy mostly floriferous stems 3–6 cm. long, the 3–5 pairs of linear or linear-lanceolate acute leaves basally connate for 2–3 mm., 1.5–2.5 mm. wide, 1–2 cm. long; pedicels mostly solitary, about 1 cm. long, erect; calyx lobes triangular lanceolate, acute, little shorter than the conic tube; corolla 18–20 mm. long, subinfundibuliform, notably fimbriate, the trichomes often as long as the broadly ovate obtuse lobes, these shorter than the tube.—Weddell type in Herb. Hooker said to read "Colombia" but Berlin specimen "Peru"; since all related species are from Peru or Ecuador the plant must have come from one of those countries (Gilg).

Peru(?): In the Andes at 4,700 meters, (*Lobb,* type).

Gentiana tristicha Gilg, Repert. Nov. Sp. 2: 39. 1906; 45.

Perennial with a tuft of grass-like leaves at base mixed with many short densely leafy shoots and a few tall slender stems pseudo-racemose above with 1 or 2–3 flowers in each of the leaf-axils; basal leaves 4–8 cm. long, scarcely 1 mm. wide, thin, the always ternate cauline remote, connate at base; pedicels slender, 1.5–3 cm. long, lax; calyx campanulate, 10 or 12 mm. long, the lobes 6 or 7 mm. long; corolla 20–22 mm. long, the obovate rounded lobes much longer than the narrow obconic tube.—Affine *G. graminea* HBK. with opposite leaves, as to type. Flowers dark rose. F.M. Neg. 10405.

Ancash: Grass-shrub formation, 4,000 meters, Pichiu, Prov. Huarí, *Weberbauer 2933,* type.

Gentiana umbellata R. & P. ex G. Don, Gen. Syst. 4: 187. 1838; 71. *Eurythalia umbellata* Don, l.c. *G. Ruizii* Griseb. in DC. Prodr. 9: 96. 1845.

Slender-stemmed biennial or short-lived perennial often several dm. tall, usually with an apical cyme of many flowers and a branch in one or two of the uppermost internodes (these several cm. long) with an apical cyme of usually 3 flowers; basal leaves rosulate, lanceolate, long-pseudopetiolate, acute, to about 5 cm. long, sometimes 1 cm. wide, marcescent, the ovate-lanceolate cauline, few to 9 cm. long, slightly connate if at all; pedicels finally 1.5–2 cm. long or longer; calyx to nearly 1.5 cm. long, lobes narrowly ovate-acuminate, longer than tube; corolla about 2–2.3 cm. long, more or less densely long fimbriate at throat, the suboblong subacute lobes and tube subequal.—Flowers, according to Weberbauer, violet, lilac, rose or dark rose to scarlet medially; Stork, throat cerulean blue, lobes lilac; Killip and Smith, rich blue, sky blue or tube whitish, lobes pale violet; bright purple (my *4370*). Habit varies little but leaves from ovate to lanceolate; flowers at stem tip largest, those of lateral shoots reduced in size from above. However, type specimen has ovate stem leaves, curved ascending base. *G. diffusa* HBK., Nov. Gen. & Sp. 3: 172. 1819, widely distributed from Ecuador to Colombia, may be known, if found in northern Peru, by the corolla lobes longer than the tube. F.M. Neg. 10410.

Huánuco: Pillao, *Ruíz & Pavón*, type; *Woytkowski 34089*. Acomayo to Chinchao, *Poeppig*. Mossy rocky places, *4370* (det. Gilg, *G. setipes*). Mito, *1400*.—Junín: Grassy hills, Palca to Carpapata, 2,900 meters, *Stork 10982* (det. Standley). Huacapistana, *Killip & Smith 24210* (det. Melchior).—Huancavelica: Surcubamba, *Weberbauer 6493* (det. Melchior).—Ayacucho: Prov. Huanta, *Weberbauer 5562; 7594* (det. Gilg, *G. dianthoides*). Pampalca, *Killip & Smith 22221; 22246* (det. Melchior). Osno, *Weberbauer 5562*.—Cuzco: Lares, *Weberbauer 4887*. Valle del Urubamba, *Herrera 3383* (det. Standley); *3431*. "Huita-clavil."

Gentiana vaginalis Griseb. Gent. 215. 1838; 49.

Root simple, rather stout, 3–8-parted at apex with many sterile rosulate stems, the fertile fewer, 2–3 cm. high, 1-flowered; leaves cartilaginous, marginally scabrous, vaginate, lanceolate- or oblong-spathulate, subacute, 6 mm. long, 2 mm. wide; flowers sessile, erect; calyx 6–8 mm. long, broadly campanulate, lobes ovate, acute, equaling the tube; corolla about 1 cm. long, obovate-elliptic lobes subobtuse, much longer than the tube.—Flowers with yellow tube, fiery red lobes (Weberbauer); type not seen by Gilg. It is possible that the Weberbauer specimens, therefore, do not belong here.

Junín: Cerro de Pasco, (*Cruickshanks*, type). Near Yauli, 4,500 meters, (*Weberbauer 329*). Hacienda Alpamina, (*Weberbauer 5109*). San José, *1102*.

Gentiana verticillata Wedd. Chloris And. 2: 309. 1859; 25.

Probably biennial (base covered with old broken leaves), type with solitary stem about 8 mm. in diameter at base, 3.5 dm. tall, erect, stout, simple, many-flowered; basal leaves nearly lacking, internodes 8, averaging about 4 cm. distant, the coriaceous 4-verticillate cauline leaves often somewhat shorter, lanceolate, acute, not or little connate, the lower about 6 cm. long, 6–8 mm. wide, the upper at most 2 cm. long; flowers 4–8 in each of the 6 upper nodes, 15–18 mm. long, the verticillate pedicels 2–5 cm. long, the lowest sometimes replaced by bifoliate peduncles, but rarely 2-flowered; calyx lobes lanceolate, acute, longer than tube, the blue-violet corolla scarcely half again as long.—After Weddell; not seen by Gilg; cf. *G. sanctorum*, ex char. doubtfully distinct; however, the name chosen by Weddell was used by Linnaeus for a species now placed in another genus.

Ancash(?): Prov. Pataz, between Chillo and Baldibuyo, 4,400 meters, (*Raimondi 20*, type).

Gentiana violacea R. & P. ex G. Don, Gen. Syst. 4: 195. 1838; 59. *Glyphospermum violaceum* G. Don, l.c. *G. ornatum* Don, l.c.?

Type with slender basally subdecumbent stems, at flowering leafless below, about 3 dm. tall, striately angulate, hispidulous, procumbent, internodes except the lowest about 1 cm. long, each with a branchlet 1–3 cm. long, this with 1–3 subnutant flowers in each axil; leaves sessile, subulate, acute, 5–10 mm. long; pedicels 1–2 mm. long; calyx about 3.5 mm. long, lobes narrowly lanceolate, acuminate, as long as or slightly longer than tube; corolla about 5 mm. long or perhaps longer in full anthesis, suboblong subacute lobes apparently nearly as long as tube.—Highly characteristic in its small flowers, leaves and pubescence. F.M. Neg. 10409.

Huánuco: Pillao, Chacahuasi and Muña, *Ruiz & Pavón*, type.

Gentiana Weberbaueri Gilg, Repert. Nov. Sp. 2: 51. 1906; 69.

Beautiful solitary-stemmed perennial, the thick unbranched root crowned with a dense rosette of linear or narrowly lanceolate-linear acute basally dilated fleshy coriaceous leaves 10–14 cm. long, 5–6 mm. wide, 3-nerved; cauline leaves similar, 4–8-verticillate, free, lanceolate or ovate-lanceolate; flowers nodding at tip of central stem and its many erect branches, as often in 2–3-flowered cymes, all forming a corymb 3–5 dm. long; pedicels 2–4.5 cm. long; calyx tubular, 12–14 mm. long, the acute lanceolate lobes about one-half as long as tube; corolla 3.5–3.8 cm. long, the ovate rounded lobes much shorter than the tube.—Allied by author to his Bolivian *G. orobanchoides*, Bot. Jahrb. 22: 333. 1896, with corolla lobes and tube subequal. Color of flowers noted by collector as raspberry- to brown-red. F.M. Neg. 10411.

A favorite flower for the adornment of crosses and sacred pictures (Weberbauer).

Ancash: In rocks or stony detritus, 4,400 meters, west of Pichiu, Prov. Huarí, *Weberbauer 2939*, type. "Pukamakaschka."

9. **HALENIA** Borckh.

References: Gilg, Bot. Jahrb. 54. Beibl. 118: 93–122. 1916; Caroline K. Allen, Ann. Mo. Bot. Gard. 20: 119–222. 1933.

Glabrous (or rarely ciliate at nodes) caulescent herbs, varying in duration, the fibrous roots herbaceous to ligneous, the opposite sessile or petioled leaves usually 3–5-veined. Inflorescence a subumbellate or rarely racemose or spicate cyme. Calyx and corolla 4-parted, the usually papillate foliaceous lobes of the former often squamellate at base, the latter marcescent, campanulate, the dexterously convolute lobes frequently auriculate and papillate. Stamens 4, included, adnate to tube, alternate with lobes, the linear (or nearly) filaments with 2-celled versatile anthers. Carpels 2, sessile, the parietal placenta many-ovuled; stigma bilobed. Capsule compressed, often subfoliate, septicidally dehiscent from tip, the globose or slightly flattened seeds granular or reticulate.—Named by Borckhausen in 1796 for Jonas Halen, who had indicated its character in a study of Kamtchatka plants.

Perhaps the greatest compliment that could be paid to Miss Allen's revision, from which I have gratefully compiled, is to emphasize one of her remarks: "If a character is variable in one species, it is reasonable to suppose that the same situation may obtain in other species." Many a well-known monograph is encumbered with doubtful "species" because Miss Allen's intelligent (and reasonable, as she modestly phrases it) observation has not been appreciated (often even by distinguished students). Nevertheless, I cannot help but feel that a number of *Halenia* species, mostly described from a single collection, will be found, when better known, to have been based on variable factors; however, at present there would be no point in disturbing

Gilg's acceptance of characters, since their genetic significance cannot now be determined, as remarked by Miss Allen, l.c. 126. In the descriptions the relative length of corolla and tube refers to the entire length of corolla, and in any case is only approximate, as other key characters.

The Peruvian species have all been described as perennial except as noted; the taller species, at least of these, often have rhizome or rhizome-like more or less subterranean-ascending stems, well developed in older plants. *H. pinifolia*, essentially a nomen nudum, has been omitted from the key.

- Spurs obsolete or obscurely developed, scarcely if at all longer than thick, rarely 1–2 mm. long; corolla 5 to rarely about 10 mm. long.
  - Plants usually 2 dm. tall or taller, clearly annual. . *H. brevicornis.*
  - Plants always low (rarely taller than 1 dm.), clearly perennial (probably one species).
    - Flowers about 1 cm. long, solitary or rarely 2–3; spurs visible. *H. caespitosa.*
    - Flowers about 5 mm. long, solitary, rarely 2–3; spurs obsolete. *H. valerianoides.*
    - Flowers about 6 mm. long, often 5; spurs visible. . . . . *H. pusilla.*
- Spurs more or less obvious; corolla about 1 cm. long or longer or in any case spurs prominent, distinctly longer than thick.
  - Spurs stout, only about twice longer than thick, pendent.
    - Stems evidently 4-alate (could be extreme development of quadrate-stemmed species).
      - Annual (so described), closely ciliolate in vicinity of nodes. *H. barbicaulis.*
      - Perennial, glabrous. . . . . *H. Killipii.*
    - Stems merely 4-angled or 4-lined, not clearly alate (similar forms).
      - Basal leaves spatulate, only 1-nerved, this prominent especially beneath; southern species. . . . . *H. spatulata.*
      - Basal leaves narrowly lanceolate, 3–5-nerved. . . . *H. Stuebelii.*
      - Basal leaves obovate, faintly 5-nerved, 4–5 mm. wide. *H. Mathewsii.*
  - Spurs slender, more or less tapering, about three (at least) times longer than thick, variously disposed at anthesis and later.
    - Stems stout, solitary in type, about 3 mm. thick or thicker, even above the oblong-elliptic or spatulate basal leaves.
      - Leaves spatulate, obtuse. . . . . *H. phyteumoides.*

Leaves oblong-elliptic, acute.................... *H. Hoppii.*

Stems slender (unless *H. Weberbaueri* with sublanceolate leaves), often several.

Spurs clearly more or less divaricate and incurved, subequaling the rest of the corolla.

Calyx lobes scarcely 3 mm. long, subobovate, rounded or not at all acute...................... *H. sphagnicola.*

Calyx lobes 4–8 mm. long, sometimes subobovate but acute or apiculate (probably one variable species).

Lower leaves (at least) elliptic-obovate, shortly acuminate or acute, mostly only 5–7 times longer than wide; calyx lobes oblong or nearly. . *H. Weddelliana.*

Lower leaves (and cauline) nearly oblong-lanceolate, acuminate or acute, often 10–many times longer than wide.

Calyx lobes narrowly obovate-lanceolate, a third as wide as long (ex char.)................ *H. bella.*

Calyx lobes broadly ovate, to nearly as wide as long (ex char.)...................... *H. asclepiadea.*

Spurs more or less pendent, incurved, usually clearly shorter than corolla except *H. silenoides.*

Corolla (without spurs) scarcely 1 cm. long; tufted perennials with many basal leaves, rarely 2 dm. tall.

Spurs three-fourths as long as corolla..... *H. silenoides.*

Spurs one-third as long as corolla (ex char.).
H. Weberbaueri.

Corolla at least one cm. long, usually longer; plant flowering as a biennial, scarcely tufted, often tall. . *H. umbellata.*

Halenia asclepiadea (HBK.) G. Don, Gen. Syst. 4: 177. 1838; 205. *Swertia asclepiadea* HBK. Nov. Gen. & Sp. 3: 175. 1819.

Flowering stem or stems simple, erect, sometimes 4 dm. high, the 1–several short densely leafy stems ordinarily from the root; petioles slender, attenuate into the narrowly lanceolate gradually acuminate basal leaves, these 3–4 cm. long, to 5 mm. wide, 3-nerved, the sessile stem leaves similar but more elongate; inflorescence a 3–8-flowered, occasionally umbelliform cyme, the pedicels to 3.5 cm. long; calyx lobes broadly lanceolate, acute, 3-nerved, to 6 mm. long; corolla greenish-yellow, without spurs, about 8 mm. long, the tube one-fourth as long, the broadly ovate lobes acute; spurs divaricate-horizontal, to 2 mm. long; stamens about 4.5 mm. long, anthers ovate; capsule acuminate, to 18 mm. long; seeds reticulate.—If the segregate species are valid it is surprising if the single Peruvian specimen referred here by Allen is correctly determined. It is noteworthy that Gilg considered the species confined to Colombia as did Reimers, Bot. Jahrb. 62: 336. 1929, and "evidently to a narrow area," but probably its character, correctly interpreted, should be drawn to include related forms; otherwise, this specimen seems to be *H. Weberbaueri*. Illustrated, Allen, l.c. *pl. 9, fig. 17* (flower). F.M. Neg. 10087.

Cuzco: Paso de Tres Cruces, 3,800 meters, *Pennell 13842* (part, fide Allen). Colombia. Ecuador?

Halenia barbicaulis Gilg, Bot. Jahrb. 54: Beibl. 118: 112. 1916; 198.

Described as annual, to 2 dm. high, the apparently erect often branching stems densely leafy, 4-alate above and closely long-ciliate at nodes; stem leaves narrowed at base into broad ciliate petioles, oblong, acute and subapiculate, to 2 cm. long, 5–6 mm. wide, 5-nerved, conspicuously reticulate-veined beneath; inflorescence a terminal subumbellate 7–9-flowered cyme or 3-flowered axillary cyme, the former with pedicels 3–4 cm. long, the latter, to 2 cm. long, all alate; calyx lobes obovate-oblong, about 7 mm. long, apiculate, obscurely 3-nerved, corolla about 1 cm. long, tube over one-third as long, the ovate subrotund lobes erose; spurs somewhat less than half as long as corolla, pendulous; stamens 2–3 mm. long, anthers ovate-oblong.—Illustrated, Allen, *pl. 11, fig. 5* (flower). F.M. Neg. 26799.

Amazonas: Chachapoyas, *Mathews*, type.

Halenia bella Gilg, Repert. Nov. Sp. 2: 52. 1906; 206.

Stems several, decumbent-ascending, the sterile densely leafy, to 1 dm. long, the fertile soon erect, simple, with internodes to 6 cm. long; basal leaves subcoriaceous, 3–5-nerved, the veins prominent beneath, oblanceolate to lanceolate, acute, 3–3.5 cm. long, 4 mm. wide; cauline leaves 3–4 pairs, similar; inflorescence usually a terminal many-flowered subumbelliform cyme, the pedicels to about 2 cm. long; calyx lobes free, obovate-lanceolate, acute, nervose, 6–7 mm. long, 2 mm. wide; corolla greenish-yellow, 8 or 9 mm. long (without spurs), the obovate lobes more or less acute; spurs somewhat spreading to horizontal, 7–8 mm. long.—Species near *H. asclepiadea* (HBK.) (Gilg). The illustration (Allen, *pl. 11, fig. 4*, flower) shows much broader calyx lobes than described. F.M. Neg. 10088.

Junín: Huacapistana, Prov. Tarma, 3,000 meters, *Weberbauer 2065*, type.

Halenia brevicornis (HBK.) G. Don, Gen. Hist. 4: 177. 1838; 140, 147. *Swertia brevicornis* HBK. Nov. Gen. & Sp. 3: 174. 1819. *S. parviflora* HBK. l.c. *H. parviflora* (HBK.) G. Don, l.c.

Root slender, annual; stems erect, usually branching only above, slightly angled and striate, sometimes several dm. tall; leaves all sessile, subconnate, linear or narrowly lanceolate, the lower to 3.5 cm. long, 4 mm. wide, the upper similar but smaller, remote, all usually prominently 1-nerved; inflorescence consisting of compact, often few-flowered cymose clusters, the erect pedicels to 18 mm. long, usually shorter; calyx lobes lanceolate, ordinarily 3-nerved and a half to two-thirds as long as the corolla, this 4–8 mm. long, its ovate acute more or less auriculate lobes about half as long; spurs obsolete (as mere depressions) or sometimes knob-like; stamens about 2 mm. long, anthers commonly deltoid; seeds minute, finely reticulate.—Illustrated, Allen, *pl. 8, fig. 11* (flower). F.M. Neg. 31877 (var.).

Huánuco: Steep grassy slope, Mito, *3431*. Without locality, *Mathews 3133*. To Mexico.

Halenia caespitosa Gilg, Repert. Nov. Sp. 2: 53. 1906; 184.

Tufted or matted but the leafless (or nearly) flowering stems sometimes a dm. or more high, 1- (or rarely 2–3-) flowered; leaves of sterile branches crowded, fleshy, oblanceolate, 1.5–2 cm. long, 3–4 mm. wide, rather obscurely 3-nerved; pedicels 1.5–2 cm. long, sometimes slightly nodding; calyx lobes oblong-lanceolate or oblanceolate, 6–8 mm. long, 2 mm. wide, acute or obtusish, 3-nerved; corolla about 1 cm. long, greenish, with long tube, short subrotund crisped lobes; spurs pendent, 1–2 mm. long and nearly as thick; stamens about 4 mm. long, affixed just below the sinus, anthers ovate; capsule narrowly ovoid, slightly falcate.—Moist or wet places; label must have been transferred on the Grant specimen, for it reads "flowers lilac" and refers to a species of Gentian. Illustrated, Allen, *pl. 9, fig. 11* (flower). F.M. Neg. 10090.

Junín: Near Yauli, 4,400 meters, *Weberbauer 279*. Morococha, *898*. La Oroya, *Kalenborn 91*. Alto del Ricrican, La Oroya to Tarma, *Isern* (det. Cuatrecasas). Cerro de Pasco, grassy limestone slope, *3072* (det. Allen, *H. pusilla*). Cobracancha Valley, northwest of Cerro de Pasco, *Verne Grant 7542*.

Halenia Hoppii Reimers, Bot. Jahrb. 62: 335. 1929; 204.

About 1 dm. tall, the flowering stem simple, erect, rather stout from a dense rosette of petioled herbaceous nervose oblong-elliptic acute leaves, 3 cm. long, 4–5 mm. wide, the 1–2 pairs of cauline leaves similar but petioles shorter; inflorescence a terminal many-flowered cyme, the pedicels 1–3 cm. long or longer; calyx lobes ligulate-elliptic, 6 mm. long, 2 mm. wide, acute and subapiculate, obsoletely 3-nerved; corolla yellow-green, 1 cm. long or shorter, the tube about a third as long, the ovate-subrotund lobes acutish; spurs very slender, pendulous, divergent at apex, one-third to one-half as long as corolla; stamens 3.5 mm. long.—The identity of the Peruvian specimen is surely open to review since apparently there are no intermediate stations, and especially since the drawing of Allen shows a flower with stout spurs, barely three times longer than broad and only a third as long as corolla. Illustrated, Allen, *pl. 9, fig. 16* (flower). F.M. Neg. 10096.

Cuzco: At 3,000 to 3,600 meters, July, 1923, (*Herrera,* fide Allen). Colombia.

Halenia Killipii Allen, Ann. Mo. Bot. Gard. 20: 187. 1933.

Pale yellow-green, the stout notably alate stem a few cm. to 2.5 dm. tall, from a robust ligneous root covered with leaf-remains; basal leaves few, rosulate, fleshy, 3-nerved, oblanceolate, attenuate into long petioles, obtuse, 2–4 cm. long, 3–3.5 mm. wide, the 1–3 pairs of sessile cauline leaves somewhat smaller, lightly nerved; inflorescence usually terminal, 1- (rarely 7-) flowered, subumbellate, the erect or slightly nodding pedicels to 2.5 cm. long; calyx lobes elliptic, acute, obsoletely 3-nerved, 5–9 mm. long; corolla 1–1.5 cm. long, the tube about a third as long, the broadly ovate lobes erose; spurs thick, pendulous, incurved, about a third as long as corolla; stamens 2 mm. long, anthers ovate; capsule ovate-attenuate.—Illustrated, Allen, *pl. 9, fig. 4* (flower).

Junín: Mount La Juntay near Huancayo, 4,700 meters, (*Killip & Smith 22087*, type; also *22083*).

Halenia Mathewsii Gilg, Bot. Jahrb. 54: Beibl. 118: 111. 1916; 188.

Flowering stems many, erect, slender, rarely 2.5 dm. tall from a thick short subterranean axis; basal leaves densely rosulate, petiolate, obovate-oblong, to 2.5 cm. long, 4–5 mm. wide, the lowest equal and equidistant on the stem, the few uppermost much reduced, sessile, oblong or ovate-oblong, more or less acute, faintly or scarcely 5-

nerved; inflorescence a 5-flowered cyme, the terminal pedicels 2 cm. long, the lateral 1.5 cm. long and shorter; calyx lobes oblanceolate, acute, 5.5 mm. long, obsoletely 3-nerved; corolla 7 mm. long, tube about one-third as long, lobes ovate-oblong, subrotund; spurs pendulous, slightly incurved, one-third as long as corolla.—Was part of *H. asclepiadea* (HBK.) G. Don by Grisebach. F.M. Neg. 31882.

Lima: Huamatanga, *Mathews 523*, type. Swale on paramo east of Canta, 4,000 meters, *Pennell 14678* (det. Allen). Open hillside, Río Blanco, (*Killip & Smith 21737*).

Halenia phyteumoides Gilg, Bot. Jahrb. 54: Beibl. 118: 112. 1916; 194.

Stem angled, stout, a dm. tall or so from a short thick root, the densely rosulate spatulate basal leaves attenuate into long petioles, obtuse or acutish, to 2.5 cm. long, 3.5 mm. wide, obsoletely 3-nerved, the 1–2 pairs of similar cauline leaves slightly narrowed but sessile, thick, 1–1.5 cm. long, 3–4 mm. wide; inflorescence a terminal 5-flowered crowded cyme (or also 3-flowered and axillary), the apical pedicels to 1 cm. long, the lateral about half as long; calyx lobes obovate-oblong, acute, obsoletely nerved, to 4 mm. long, half as wide; corolla 8 mm. long, tube scarcely half as long, lobes ovate-oblong, subrotund; spurs slender, pendulous, incurved, one-half as long as corolla.—F.M. Neg. 10104.

Junín: Valley of the Marañón near Tarma, (type sent by Philippi to Kunth).

Halenia pinifolia [R. & P.] G. Don, Gen. Syst. 4: 177. 1838; 185. *Swertia pinifolia* R. & P. in herb. ex G. Don, l.c.

Tufted, the simple erect stems to 1.5 cm. high, the linear acute canaliculate leaves marginally scabrous; inflorescence umbellate; calyx lobes ovate-lanceolate, acute; corolla golden-yellow, the straight spurs about half as long.—Not found at Madrid (or elsewhere) and, as Gilg remarked, Bot. Jahrb. 54: Beibl. 118: 108. 1916, the meager description is not diagnostic and indeed suggests that the plant may not be correctly placed.

Peru(?). Without data, (*Ruiz & Pavón*).

Halenia pusilla Gilg, Bot. Jahrb. 54: Beibl. 118: 107. 1916; 182. *H. Dombeyana* Wedd. var. *brevicornis* Wedd. Chloris And. 2: 76. 1859, fide Gilg.

Cespitose, scarcely attaining 7 cm. from a short thick root covered with marcescent petioled leaves, the living apical densely rosulate, very thick, oblanceolate, acute, 1–1.5 cm. long, 2–3 mm. wide, obsoletely 3-nerved; cauline leaves approximate, 1–2 pairs, sessile, oblong or ovate-oblong, 6–7 mm. long, 3–3.5 mm. wide; flowers usually 5, the pedicels to 1 cm. long; calyx lobes oblong-lanceolate, 5 mm. long, 2 mm. wide, acute, obscurely 3-nerved; corolla 5–6 mm. long, tube about half the length, the ovate lobes acute; spurs merely prominent protuberances; stamens 2 mm. long, anthers ovate-attenuate; capsule ovate.—Illustrated, Allen, *pl. 9, fig. 14* (flower). F.M. Neg. 10106.

Cuzco: Pauticalla Pass, 3,600 meters, (*Cook & Gilbert 1793*). Bolivia.

Halenia silenoides Gilg, Bot. Jahrb. 54: Beibl. 118: 113. 1916; 195.

A dm. or two high from a thick much-branched root, the simple erect stems clotted at base with marcescent leaves, the short sterile stems densely leafy; basal leaves many, long-petioled, oblong-lanceolate, acute, less than 2 cm. long, 3.5 mm. wide, 3-nerved; cymes termineral or axillary, 3–10-flowered, the pedicels to 2.5 cm. long, calyx lobes oblong-lanceolate, acute, 3–5 mm. long, reticulate and 1-nerved; corolla about 9 mm. long, tube about half as long, spurs more than a third as long, slender, divergent, apically incurved; stamens 2.5 mm. long, anthers broadly ovate, acute, capsule to 1.1 cm. long, narrowly ovate, subfalcate at acuminate tip; seeds subglobose, reticulate.—*Pennell 13842* at New York Botanical Garden is *H. asclepiadea*, at United States National Herbarium and Philadelphia Academy of Natural Sciences certainly *H. silenoides* (Allen). F.M. Neg. 31883 of *Mandon 369* is not this plant as the spurs are short. Illustrated, Allen, *pl. 9, fig. 15* (flower).

Cuzco: Paso de Tres Cruces, *Pennell 13842* (part). Bolivia.

Halenia spatulata Allen, Ann. Mo. Bot. Gard. 20: 183. 1933.

Cespitose, to about a dm. tall from a rather coarse ligneous root, the 1–2 erect usually simple flowering stems with occasional short sterile leafy branches; basal leaves many, attenuate to long petioles, elliptic-spatulate, to 2.5 cm. long, 4–5 mm. wide, prominently 1-nerved, the 1 or 2 cauline pairs sessile, elliptic, shorter than 1 cm.; cymes usually terminal, 1–few-flowered, the pedicels sometimes slightly recurved at tip, 1.5 cm. long or longer; calyx lobes spatulate, to 6 mm.

long, 2 mm. wide, 3-nerved; corolla lime-green, 1 cm. long, the tube over half as long, the broadly ovate lobes acute; spurs about a fourth as long as corolla, pendulous and incurved, attenuate from broad base; stamens 2 mm. long, anthers ovate; capsules broadly lanceolate.—Illustrated, Allen, *pl. 9, fig. 10* (flower).

Cuzco: Open grassy puna, 3,900 meters, Cerro de Colquipata, *Pennell 13749*, type.

Halenia sphagnicola Gilg, Bot. Jahrb. 54: Beibl. 118: 121. 1916; 207.

Type about 2.5 dm. tall, the root multifibrous, the slender caudex with several curved-ascending sterile branches and an erect, simple or basally leafy and branched flowering stem, remotely leafy above; basal leaves rosulate, rather abruptly long-petiolate, obovate, 1.5–about 2 cm. long, 5 mm. wide, the petiolate lower cauline similar but about 3 mm. wide, acute, the more or less sessile upper cauline oblong-lanceolate, to about 1 cm. long, 2–2.5 mm. wide, acute to acuminate, obscurely 3-nerved; cymes terminal, many-flowered, subglobose, the pedicels little longer than 1 cm.; calyx lobes obovate or suboblong, scarcely 3 mm. long, to half as wide, obsoletely 3-nerved; corolla sulphur-yellow, 6–6.5 mm. long, the tube less than half as long, the ovate lobes rounded; spurs slender, subhorizontally divaricate, often curved upward at apex, nearly as long as corolla.—F.M. Neg. 10109.

Amazonas: Molinopampa east of Chachapoyas, in sphagnum moor, 2,400 meters, *Weberbauer 4376*, type.

Halenia Stuebelii Gilg, Bot. Jahrb. 54: Beibl. 118: 110. 1916; 190.

Biennial, the stout erect simple or basally branched stem sometimes 3–4 dm. tall; basal leaves densely rosulate, lanceolate, narrowed at base, acute, 3–3.5 cm. long, 3–4 mm. wide, the cauline sessile, oblong-lanceolate, 2–5 cm. long, 3 mm. wide, all fleshy herbaceous, obviously (3-) 5-nerved, the nerves prominent beneath; terminal cymes dense, 5–9-flowered, the axillary 1–5-flowered; pedicels 1 to nearly 3 cm. long; calyx lobes lanceolate, acute, 7–8 mm. long, 2.5 mm. wide, obsoletely 3–5-nerved; corolla nearly 1 cm. long, the tube about a third as long, the lobes ovate-oblong, acute; spurs pendulous, incurved, about a third as long as corolla.—The petals are shown as erose in the drawing made from my collection. The Pennell specimen at Chicago Natural History Museum has the short spurs of this species so its reference to *H. Kalbreyeri* Gilg of Colombia (nearly

H. asclepiadea) is incorrect. Illustrated, Allen, *pl. 9, fig. 5* (flower). F.M. Neg. 10111.

Amazonas: Pacasmayo to Moyobamba, *Stuebel 49e*, type.—Lima: Wet slope, Río Blanco, *3040*.—Cuzco: La Raya, 4,400 meters, *Pennell 13513*.

Halenia umbellata (R. & P.) Gilg, Repert. Nov. Sp. 2: 53. 1906; 196. *Swertia umbellata* R. & P. Fl. Peruv. 3: 21, *pl. 242, fig. b*. 1802. *H. Pavoniana* G. Don, Gen. Syst. 4: 177. 1838. *H. gracilis* (HBK.) G. Don var. *Dombeyana* Griseb. in DC. Prodr. 9: 130. 1845. *H. Dombeyana* (Griseb.) Wedd. Chloris And. 2: 76. 1859.

Sometimes 4 dm. tall, the ligneous root often sending out short sterile leafy branches as well as 1–3 usually simple erect or sometimes arcuate-ascending finely striate flowering stems, these not rarely branched above; basal leaves many, more or less marcescent, oblong-elliptic, attenuate into slender petioles, acute, 2–3.5 cm. long, 6–8 mm. wide, 3-nerved; cauline 2–3 pairs, similar or the upper subsessile or sessile; cymes in umbellate terminal or axillary inflorescences, 5–14-flowered, pedicels to 3.5 cm. long, the shorter marginal more or less recurved; calyx lobes obovate-elliptic, to 6 mm. long, subacuminate, 3-nerved, reticulate at tip; corolla 10–13 mm. long, tube slightly less than half as long, lobes ovate-oblong, acutish; spurs less than half as long as corolla, very slender, tapering, slightly if at all divergent; stamens 2–2.5 mm. long, anthers broad-oblong, acutish; capsules to 1.5 cm. long, narrowly ovate-acuminate, subfalcate; seeds reticulate. —By Gilg restricted to plants without rosulate basal leaves. Illustrated, Allen, *pl. 9, fig. 20* (flower). F.M. Neg. 26803.

Lima: Baños, *Dombey*.—Huánuco: Among shrubs, La Quinua, *2001* (det. Allen). Mito, *1657* (det. Allen). Pillao and Panao, *Ruiz & Pavón*, type, pt.—Junín: Bombón & Tarma, *Ruiz & Pavón*, type, pt.—Cuzco: Lucumayo Valley, (*Cook & Gilbert 1308*). Panticalla Pass, (*Cook & Gilbert 1811*). Valle del Urubamba, *Herrera 3393*. Cerro de Colquipata, *Pennell 13738* (det. Allen).—Puno: Sandía, (*Weberbauer 6801*, det. Gilg). Agapata, *Lechler 2001*.

Halenia valerianoides Gilg, Bot. Jahrb. 54: Beibl. 118: 106. 1916; 182.

Tufted on a robust closely branched root, a few cm. high, the stems subscapose; leaves rosulate, petiolate, fleshy, oblanceolate, acute, 2–3 cm. long, 4 mm. wide, obsoletely 3-nerved, the cauline (if any) broadly sessile, 1 pair, ovate-oblong, 5–6 mm. long, 2–3 mm.

wide; cyme terminal, 1–3-flowered, pedicels 7–10 mm. long; calyx lobes obovate-oblong, 3 mm. long, 2 mm. wide, acute, obsoletely 3-nerved; corolla about 5 mm. long, 4 mm. broad, the tube less than half as long, lobes ovate, acute; spurs small laterally prominent protuberances.—Number of type an error, since data on label (as corolla rose) do not agree with specimen (Gilg). According to label it came from Santa Clara, at over 4,000 meters, and the plant is obviously high-montane. F.M. Neg. 10114.

Peru: Locality unknown, probably between 3,000 and 4,000 meters in the central Andes, *Weberbauer 1676*, type.

Halenia Weberbaueri Allen, Ann. Mo. Bot. Gard. 20: 189. 1933.

Cespitose from fibrous root, the remains of the slender petioled basal leaves persisting; stems to 1 dm. tall, usually several, rather stout, leafless except for 1–2 pairs of sessile leaves near base, these sublanceolate, 3–4 cm. long, 2–3 mm. wide, obtuse, 3-nerved, the crowded basal similar but longer and to 4 mm. wide; terminal subumbellate cymes 3–5-flowered, the occasional axillary cyme 1-flowered; pedicels to 2 cm. long, mostly curved at tip; calyx lobes somewhat oblanceolate, acute to obtuse, more or less clearly 3-nerved, 4–6 mm. long; corolla greenish, with spurs 12–15 mm. long, the tube about half as long, the ovate acute lobes erose; spurs at least a third as long as corolla, slender, pendulous, often slightly divaricate but always incurved apically; stamens less than 2 mm. long, anthers ovate; capsule lanceolate-attenuate.—Seems rather intermediate to *H. umbellata* and *H. asclepiadea*. Illustrated, Allen, *pl. 9, fig. 18* (flower).

Ayacucho: In rocks, Mt. Razuhuillca, Prov. Huanta, 4,300–4,500 meters, *Weberbauer 7498*, type.

Halenia Weddelliana Gilg, Bot. Jahrb. 25: 724. 1898; 202.

Often 2–3 dm. tall or taller; root fibrous; sterile and flowering stems several or many, more or less erect, the numerous rosulate basal leaves marcescent, petioled, elliptic-obovate or -spatulate, acute, 1–3 (–5) cm. long, 2–6 mm. wide, 3-nerved, the subconnate cauline similar, either reduced or as large; inflorescence terminal or also lateral, subumbellate or subcapitate, several to many-flowered cymes, the pedicels a few mm. to 2.5 cm. long; calyx lobes obovate-oblong to oblong, 5–8 mm. long, acuminate or acute, obsoletely 3-nerved; corolla yellow-green, 12–15 mm. long (with spurs), the tube less than half as long, the ovate lobes acute to subrotund, entire or crenulate, erose;

spurs about as long as petals, pendulous-spreading, somewhat incurved; stamens 2.5–3.5 mm. long; anthers ovate; capsule lanceolate-ovate.—Includes, after Allen, Colombian material, the type, however, from Ecuador; quite possibly this earliest segregate of *H. asclepiadea* should become a part of it along with *H. bella.* It was included by Weddell in *H. plantaginea* (HBK.) Griseb., restricted by Gilg (and Allen) to a similar Mexican species, a problem, may be subject to critical review. Illustrated, Allen, l.c. *pl. 9, fig. 3* (flower). F.M. Neg. 10117.

San Martín: Rioja, *Sandeman.*—Huánuco: Wet rocky upland, Tambo de Vaca, *4362* (det. Allen). Chaglla, *Woytkowski 72* (det. Cuatrecasas).—Junín: East of Huancayo, *Stork & Horton 10215* (det. Standley, *H. umbellata*).—Ayacucho: Grassy places in shrubwood, Choimacota Valley, Prov. Huanta, *Weberbauer 7524* (det. Allen).—Cuzco: Marcapata, *Weberbauer 7781.* Pillahuata, *Vargas 434* (det. Standley). Near Cuzco, *Soukup 132* (det. Standley). Yucay, *Soukup 713* (distr. as *H. umbellata*). Paucartambo, *Herrera 2234; Balls 6700* (distr. as *H. umbellata*). To Colombia.

APOCYNACEAE. Oleander or Chicle Gum Family

Shrubs, trees or more or less ligneous climbers (Peru) often with a milky, sometimes sweet sap or latex, simple and entire, usually opposite or whorled leaves without stipules (but now and then with interpetiolar glands) and regular monopetalous flowers, the calyx and corolla lobes as stamens ordinarily five, or four (calyx apparently rarely 7–9-parted). Corolla lobes convolute or usually twisted (in either direction) in bud, the anthers conniving around the stigma or often adhering somewhat to it, the pollen traditional—that is, not collected into waxy or granulate masses as in the Asclepiadaceae. Filaments separate. Ovary superior to partly inferior, 1–2-celled, commonly 2, also united into 1, free and separate but not infrequently the styles and always the stigmas are completely fused, resulting in the so-called stigma head; generally, too, there is a ring, membrane or process associated with it. Fruit dry or fleshy, dehiscent or indehiscent, the 1–many seeds sometimes comose, highly variable in shape and size.

Fortunately, this account of the Peruvian species has been delayed sufficiently to be based not only on the work of Markgraf (cited as apropos) to which Monachino has meritoriously given appreciation but also on the latter's lucidly presented revisions of the genera pertaining to the tribe Carisseae (see Lloydia 9: 293–309. 1946) and Woodson's careful and detailed treatment of the Echitoideae (see

Ann. Mo. Bot. Gard. 20: 624–625. 1933, and other papers as cited under genera concerned). In calling attention to my indebtedness to these authors from whom I have freely, and I hope accurately, compiled, it is just to remark that any changes have been prompted by expediency, in order to conform to the character of this work. Following their own later examples the names of Woodson and Markgraf when cited as authorities are abbreviated Woods. and Mgf., respectively.

Family is economically important as the source of chicle, the basic ingredient of chewing gum (compare *Couma macrocarpa*), while the same tree or similar ones are the cow or milk trees so useful to the popular writer or lecturer. Actually, the latex of these species, according to many authentic accounts, may be palatable either directly from the tree or diluted with coffee or tea. The group also includes a number of ornamentals, shrubs and vines as *Allamanda, Oleander,* Periwinkles (*Vinca major* L., leaves sometimes mottled, in Puno) and Clavel (*Lochnera rosea* (L.) Rchb.). Some of these are more or less escaped from gardens and naturalized in Peru and are described below. The attractive Chile Jessamine or Jasmine with large white fragrant flowers is actually *Mandevilla* (*M. suaveolens* Lindl.) and not to be confused with the true Jessamines or Jasmines with yellow flowers which belong to an Asian genus of the olive family.

Besides the following, mention may be made of *Landolphia* Pal. de Beauv., which may occur, possibly *L. boliviensis* Mgf. (cf. Monachino, Lloydia 8: 300–312. 1945); it may be known from *Couma* as scandent, the terminal inflorescence serving as tendrils; it is the source of landolphia rubber.

Corolla lobes, if twisted, to the left; anthers free, usually dehiscent to base even if sagittate (Peru); seeds not plumose (Carisseae).
  Anthers not sagittate; fruits usually syncarpous, drupaceous, rarely capsular with processes or follicular.
    Leaves opposite; ovary superior.
      Trees or shrubs; flowers small or medium; ovary nearly or quite syncarpous.
        Clavuncle not crested; inflorescence terminal or axillary.
          Inflorescence terminal; clavuncle not lanate-hirsute.
            Lateral leaf nerves more than 5 mm. distant.
              1. *Parahancornia.*
            Lateral leaf nerves approximate, often 1–2 mm. distant.
              2. *Hancornia.*

Inflorescences axillary; clavuncle lanate-hirsute.
3. *Lacmellea.*

Clavuncle flabellate-crested with ring at base; inflorescence terminal and axillary..................4. *Ambelania.*

Liana with many almost minute flowers; ovary apocarpous.
7. *Condylocarpon.*

Leaves at least mostly whorled, spiralled or alternate; ovary often subinferior in a disk or this lacking.

Flowers small, salverform or subtubular.

Leaves usually all whorled; flowers roseate or white.

Flowers many, roseate; ovary syncarpous; fruit a berry.
5. *Couma.*

Flowers few, white or reddish-blue; ovary apocarpous; drupes subglobose..................6. *Rauvolfia.*

Leaves all alternate or approximate; flowers few–many, often yellowish or greenish; ovary apocarpous.

Leaves to 7 cm. long; drupes 1–2-seeded.....8. *Vallesia.*

Leaves mostly larger; follicles often compressed, seeds many.

Corolla tube longer than lobes; disk obsolete; follicles not elongate..................9. *Aspidosperma.*

Corolla tube shorter than lobes; disk developed; follicles elongate................10. *Laxoplumeria.*

Flowers large, often funnelform, usually yellow, red or purple.

Leaves linear; flowers yellow; pedicels long; apocarpous fruit dry............................11. *Thevetia.*

Leaves broad, not linear; flowers various; pedicels short.

Fruit follicular; leaves opposite...........12. *Lochnera.*

Fruit capsular; leaves evenly whorled; flowers yellow or purple..........................13. *Allamanda.*

Fruit drupaceous; leaves spiralled at branchlet ends; flowers red and yellow, or white.

Bracts large (caducous), minutely glandular in axils.
14. *Himatanthus.*

Bracts small (caducous), not glandular at base.
15. *Plumeria.*

Anthers sagittate; fruits apocarpous, fleshy; shrubs or trees, leaves opposite.

Leaves dark, lateral nerves free quite to margin; ovary pubescent; fruit large........................16. *Macoubea.*

Leaves light, lateral nerves joining before margin; ovary glabrous. 17. *Tabernaemontana.*

Corolla lobes ordinarily overlapping to the right; anthers adhering to stigma, sagittate, not dehiscent to base; lianas or climbers; seeds plumose except *Malouetia.*

Basal anther auricles thick, obtuse or truncate; stigma 5-angulate-spreading or subglochidiate except *Allomarkgrafia;* leaves glandular above except a few Mandevillas.

Inflorescences compound, di- or trichotomously bostrychoid.

Corolla infundibuliform; stigma fusiform.18. *Allomarkgrafia.*

Corolla salverform; stigma umbraculiform....19. *Mesechites.*

Inflorescences simple, racemiform or rarely obscurely paniculate. 20. *Mandevilla.*

Basal anther auricles slender or attenuate; stigma fusiform to subcapitate; leaves eglandular except Forsteronias indistinctly at base.

Calyx scales, if present, commonly more numerous than lobes, never opposite them; corolla without callous faucal annulus, but appendaged in *Nerium.*

Calyx scales present; flowers only to about 2 cm. long except *Odontadenia,* its few–many flowers with annular disk.

Shrubs or trees; inflorescence corymbose or umbellate.

Corollas showy, funnelform, in corymbs; seeds comose. 21. *Nerium.*

Corollas small, salverform, in umbels; seeds ecomose. 22. *Malouetia.*

Lianas, slender or stout; inflorescence usually thyrsoid, scorpioid or paniculate.

Corolla salverform, relatively small.

Flowers rarely 5 mm. long, anther, at least tips, usually exserted.......................23. *Forsteronia.*

Flowers about 1 cm. long, anthers entirely included. 24. *Secondatia.*

Corolla, if salverform, large, showy; lianas, often stout.

Leaves not peltate; seeds truncate...25. *Odontadenia.*

Leaves peltate; seeds rostrate..........26. *Peltastes.*

Calyx scales obsolete; disk 5-lobed or -parted; rather small slender lianas with large, often single flowers.
27. *Rhabdadenia.*

Calyx scales as many as lobes and opposite them (sometimes lacerate) or if obsolete with a callous faucal annulus.

Corolla orifice not annulate; anthers entirely included.
28. *Macropharynx.*

Corolla orifice annulate; anthers exserted except some Prestonias.

Calyx lobes each with a glandular scale......29. *Prestonia.*

Calyx lobes without scale or gland..........30. *Laubertia.*

1. PARAHANCORNIA Ducke

Reference: Monachino, Lloydia 6: 240–247. 1944.

Resembles *Couma* but branchlets compressed or subterete, leaves opposite with eglandular petioles, blades with unequally developed lateral nerves not arcuately joined and dots always lacking. Inflorescences terminal as well as axillary. Calyx lobes usually 4, glabrous within. Anthers inserted mostly below middle of corolla tube. Ovary closely pubescent, mostly superior, never capped with thickened tissue, the stigmas from a usually pyriform podium without a membranous collar, the stigma lobes glabrous.

Latex said to be bitter and inferior, economically, to that of *Couma.*

Parahancornia peruviana Monachino, Lloydia 6: 242. 1944.

Erect columnar tree with spreading crown; leaves glabrous, about 8 cm. long, 3.5 cm. wide, narrowed to base, shortly caudate at the rounded apex, the acumen itself about 4 mm. long; pedicels as branches compressed, the many-flowered inflorescences glabrous or essentially, the calyx lobes usually merely ciliate; corolla tube sparsely puberulent without, the lobes about 14 mm. long; mature style not quite 1 mm. long.—Merely a glabrescent short-styled segregate of *P. amapa* (Huber) Ducke of eastern Amazonian Brazil to Dutch Guiana (author) but no intermediate specimens yet observed. Williams noted it as often 35 meters tall, a meter in diameter at base, the bark at least a cm. thick, reddish-brown, and as the sapwood with a copious latex; fruit large, green, the yellowish pulp pleasantly flavored.

Loreto: Balsapuerto, *Klug 2979*, type. Mouth of the Río Santiago, *Tessmann 3619*. Upper Río Nanay, *Williams 913*. "Naranjo podrido" (Williams).

2. HANCORNIA Gomes

Reference: Monachino, Lilloa 11: 19–48. 1945.

Resembles *Parahancornia* but the leaf-nerves approximate, interpetiolar stipuliform glands present, corolla tubes elongate, the lobes relatively short, anthers inserted toward top of the corolla tube, ovary often glabrous, style elongate and stigma and lobes different in shape (Monachino).

B. E. Dahlgren, in his excellent handbook, *Tropical and Subtropical Fruits* (Chicago Natural History Museum) 66, describes the "mangaba" as one of the most delicious and pleasantly scented of wild fruits. However, it may be poisonous until perfectly ripe. The fruits fall at a touch and are the size of large olives, egg-shaped, smooth, spotted or streaked with dark red, the flesh white.

Hancornia speciosa Gomes, Obs. Bot. Med. Pl. Bras. 2: 1, *pl. 1*. 1803; 24.

Shrub or small tree usually with several stems, lax or drooping branches, small opposite leaves and dischasial terminal inflorescences of 1–5 slender funnelform white or yellowish fragrant flowers; petioles 3–15 mm. long; leaves elliptic or oblanceolate, shortly and obtusely acuminate, 3.5–10 cm. long, 1.5–5 cm. wide, glabrous to pubescent beneath; pedicels to 11 mm. long; calyx lobes ovate to broadly oblong, 1–3 mm. long, glabrous at least within, eglandular; corolla tube 2.2–3.5 cm. long, 1.5–4 mm. wide, somewhat constricted at throat, pilose within, the lobes usually 12–24 mm. long, 3–5 mm. wide; anthers 2.3–3.4 mm. long, appendaged; ovary sometimes pubescent above, 1-celled; style filiform, bearded base and apex, the 2 stigma apiculi obtuse, short; seeds 1–6.

The single species has been a source of rubber but according to Monachino has never been cultivated successfully outside of South America and there maximum production has never exceeded 1,000 tons any year (see his paper for an extensive bibliography). Mueller Argoviensis, l.c., recorded it from Tabatinga, Brazil, at the Peruvian boundary, but since it has not been observed again within many hundreds of miles, the labeling or identification may have been an error; compare Monachino, l.c. 32, for a discussion of this and reports of the occurrence of the species within Peru, where, as this author remarks, "there is no strong reason why the tree might not grow." Illustrated, Dahlgren, l.c.; Mueller in Mart. Fl. Bras. 6, pt. 1: *pl. 8.* F.M. Neg. 7521.

Peru (possibly). Central Amazonian Brazil to Paraguay.

3. LACMELLEA Karsten

Zschokkea Muell. Arg. in Mart. Fl. Bras. 6, pt. 1: 20, *pls. 6, 7.* 1860, fide Bentham, also Monachino.

Reference: Monachino in Lloydia 7: 275–302. 1945.

Small trees, trunk columnar with gray or brownish bark, sometimes with deciduous conic spines, crown usually dense, latex abundant, sweet or bitter. Leaves opposite; the petioles usually glandular at base. Inflorescences axillary, pedicels short, the greenish-white flowers usually fleshy. Anthers attached in mature flower at about three-fourths above the base, linear-lanceolate, the acumen setose-filamentose or mucronulate. Ovary superior, glabrous, the 2–10 mm. long style lanate until maturity. Fruit a usually edible berry 1–3 cm. in diameter, with 1 or 2 seeds.

Corolla lobes spreading, at maturity longer than 3.5 mm.
  Style branches hirtellous above lanate part; anther tips penicillate; corolla tube about 1.5 cm. long. . . . . *L. lactescens.*
  Style branches glabrous above lanate part; anther tips glabrous or pilose; corolla tube longer than 2 cm.
    Petioles 3–10, leaf blades 5–10 cm. long. . . . . *L. grandiflora.*
    Petioles 5–13, leaf blades 10–20 cm. long. . . . . *L. floribunda.*
Corolla lobes erect, shorter than 3 mm.
  Corolla lobes 1.3–2.5 mm. long, eciliate.
    Leaves minutely black-dotted beneath. . . . . *L. Foxii.*
    Leaves not dotted. . . . . *L. arborescens.*
  Corolla lobes 1–1.3 mm. long, ciliate.
    Lateral nerves 14–20 pairs, 4–5 mm. distant at middle. *L. Klugii.*
    Lateral nerves 6–12 pairs, 7–12 mm. distant at middle. *L. ramosissima.*

Lacmellea arborescens (Muell. Arg.) Monachino, Lloydia 7: 297. 1945. *Zschokkea arborescens* Muell. Arg. in Mart. Fl. Bras. 6, pt. 1: 22. 1860. *Z. peruviana* van Heurck & Muell. Arg. Obs. Bot. 2: 148. 1871.

Shrub or slender tree; petioles 0.5–1.5 cm. long; leaves usually elliptic, broadly cuneate at base where decurrent, 7–15 cm. long, 3–6 cm. wide, typically lustrous above, the 17–30 pairs of lateral nerves 4 or 5 mm. apart near middle; inflorescence branches 2–9 mm. long, ascending-spreading, 5–20-flowered, the peduncle 4–15 mm. long or obsolete; calyx lobes 1.7–2.2 mm. broad, 1.3–2 mm. long; corolla tube 12–17 mm. long, glabrous without, the lobes 13–22 (28) mm. long, about 1.3 mm. wide, puberulent both sides in type, erect or suberect; anthers 5–6 mm. long, the acumen 0.3–0.5 mm. long, glabrous; style 4–6 mm. long, the lanate portion 1.6–2 mm. long, the branches glabrous, 0.8–1.4 mm. long.—The Peruvian tree is var. *peruviana* (van Heurck & Muell. Arg.) Monachino, the corolla lobes glabrous or very sparsely puberulent, the leaves often dull above. Williams described the wood but confused it with *L. ramosissima* to which Markgraf referred his *3983* and *6535*. F.M. Negs. 20120; 20121; 26902 (var.).

San Martín: Tarapoto, *Spruce 4934* (type, var.); *Williams 6535; 6562*. Pongo de Cainarachi, *Klug 2764*.—Loreto: Lower Río Huallaga, *Williams 3983; 4384; 4546; 4678*. Brazil. "Huiqui-caspi," "pajar-umu," "quinaquina" (all Williams).

Lacmellea floribunda (Poepp.) Benth. in Benth. & Hook. Gen. Pl. 2: 694. 1876; 290. *Hancornia floribunda* Poepp. in Poepp. & Endl. Nov. Gen. & Sp. 3: 70, *pl. 279*. 1845. *Zschokkea floribunda* (Poepp.) Muell. Arg. in Mart. Fl. Bras. 6, pt. 1: 23. 1860.

Small tree or tall shrub; petioles 7–13 mm. long; leaves lanceolate to elliptic, rounded to broadly cuneate at base, abrupt acute acumen to 1.5 cm. long, 1–1.5 dm. long, 3–7.5 cm. wide, usually lustrous above, the 17–20 pairs of nerves averaging 5–7 mm. distant near the middle; inflorescences lax, branches 5–10 mm. long, spreading or reflexed, flowers 5–7, the peduncles 7–15 mm. long; calyx lobes 2.5–3 mm. wide, 1.5–2 mm. long; corolla tube 3.5 cm. long, glabrous without, the lobes 3.5–4 mm. long, about 2.5 mm. wide, puberulent both sides, spreading at maturity; anthers 8.5 mm. long, the acumen 0.5–0.6 mm. long, apparently glabrous; style 10.5–11.5 mm. long, the lanate part 1.5–2.5 mm. long, the glabrous branches 0.9–1.3 mm. long. —Williams noted the bark as grayish-brown with lighter-colored lenticels, the meager latex insipid. F.M. Neg. 26900.

Loreto: Iquitos, *Williams 3739; Killip & Smith 27300; Klug 721; 289* (det. Markgraf). Amazonian Brazil.

Lacmellea Foxii (Stapf) Monachino, Lloydia 7: 296. 1945. *Zschokkea Foxii* Stapf, Kew Bull. 38. 1912.

Petioles 8–9 mm. long; leaves elliptic, shortly acute at base, 4.5–7 cm. long, 2.2–3.5 cm. wide, minutely black-dotted beneath, brownish above, coriaceous, with 15–17 pairs of slender secondary nerves; inflorescences many-flowered, the peduncles 4–5, the branches 3–4 mm. long; calyx 2.5 mm. long; anthers about 5 mm. long; style below lanate part 3 mm. long, the branches 2 mm. long.—Ex char. close to *L. microcarpa* (Muell. Arg.) Monachino, l.c. 295, of Colombia and northern Brazil (Monachino); except for the slightly longer peduncles and twice as long style branches, the inadequate description discloses no differences. The type is *Fox 31* between Rios and Solana, about 72° W. Long., 1° S. Lat. in Putumayo Territory, while *L. microcarpa* may be in the same area since known from northern Brazil and adjacent Colombia.

Peru (probably). Colombia.

Lacmellea grandiflora Monachino, Lloydia 7: 289. 1945.

Branchlets acutely quadrate or sometimes compressed; petioles 3–6 mm. long; leaves lanceolate to suboblong, rounded or broadly cuneate at base, acumen 0.5–1.5 cm. long, chartaceous, 5–9 cm. long, 1.5–3 cm. wide, the 20 pairs of secondary nerves about 4 mm. apart at middle, hirtellous or glabrous; inflorescence branches ascending, about 3-flowered, the basal peduncle obsolete or to 4 mm. long; calyx lobes ovate, 3–3.5 mm. long, 3 mm. broad, strongly ciliate; corolla tube about 3.5 cm. long, sparsely hirtellous, the glabrous spreading lobes 6 mm. long, 3.5 mm. wide; anthers (filaments obvious) 5 mm. long, with none or 1–3 apical trichomes, the acumen about 0.5 mm. long; style 9.5–11 mm. long, the lanate part 1.5–2 mm. long, the glabrous branches 0.5 mm. long.—Simulates *L. pauciflora* (Kuhlm.) Monachino, 290, the branchlets not acutely angled, corolla tube glabrous, and known only from Bahia, Brazil (author). Wood described by Williams, Field Mus. Bot. 15: 430. 1936, under *Zschokkea gracilis* M. Arg. of Brazil with branchlets only 1.5 mm. thick, anthers sessile.

Loreto: Balsapuerto, *Klug 3014*, type. Mouth of the Río Santiago, *Tessmann 4012*. Puerto Melendez, *Tessmann 4739*. Pebas, *Williams 1738*.

Lacmellea Klugii Monachino, Lloydia 7: 298. 1945.

Petioles 5–7 mm. long; leaves elliptic, broadly to somewhat sharply cuneate at base, 5.5–11 cm. long, 2–5.5 cm. wide, dull both sides, drying brownish above, the 14–20 pairs of secondary nerves 4–5 mm. apart in the middle; inflorescence branches 1–2 mm. long, ascending to spreading, usually densely 8–30-flowered, the peduncle obsolete or 2–3 mm. long; calyx lobes 12–14 mm. wide, only 1 mm. long; corolla tube 15 mm. long, glabrous without, usually arcuate at maturity, the erect lobes 1–1.3 mm. long, 1 mm. wide, dorsally thickened, the somewhat spreading thin margin ciliate, glabrous without, short-pilose at base within; anthers 4–4.5 mm. long, acumen 0.16–0.3 mm. long, glabrous; style 3.5–4.5 mm. long, the lanate part 1–1.5 mm. long, the glabrous branches 0.8–1 mm. long.—A puzzling entity, in foliage indistinguishable from some species of *L. arborescens* var. *peruviana,* in flowers from *L. ramosissima* (author). Markgraf referred the type and most of the collections to the latter; obviously this is another problem soluble only with study of more materials.

Loreto: Mishuyacu, *Klug 840,* type; *388; 402.* Between Río Nanay and Río Napo, *Williams 676.* "Pajar-umu" (Williams).

Lacmellea lactescens (Kuhlm.) Monachino, Lloydia 7: 288. 1945. *Zschokkea lactescens* Kuhlm. Archiv. Jard. Bot. Rio Jan. 5: 207. 1930.

Branchlets slender; petioles to 1 cm. long; leaves lanceolate, usually broadest below the middle, rounded to broadly cuneate at base, 4–10 cm. long, 2–4 cm. wide, the 8 or 9 pairs of principal secondary nerves 7 mm. distant near the middle; inflorescences 5–23-flowered, the branches finally spreading-reflexed, the primary peduncle 5–10 mm. long; calyx lobes about 2 mm. wide, 1.2–1.8 mm. long; corolla tube about 1.5 cm. long, glabrous without, the spreading or reflexed lobes 4.5–7 mm. long, 2–3 mm. wide, obscurely puberulent apically and subciliate; anthers 4–4.5 mm. long, acumen about 0.3 mm. long, minutely penicillate; style about 5.5 mm. long, the lanate part 4 mm. long, the hirtellous branches 0.16–0.23 mm. long.

Loreto: Iquitos, (*Ducke 22410; Bliss 234*). Río Mazán, *Williams 159.* Amazonian Brazil to Colombia. "Tananqueira preta" (Bliss).

Lacmellea ramosissima (Muell. Arg.) Monachino, Lloydia 7: 299. 1945. *Zschokkea ramosissima* Muell. Arg. in Mart. Fl. Bras. 6, pt. 1: 21, *pl. 7.* 1860.

Leaves elliptic, cuneate to acuminate at base, decurrent on the 3–6 mm. long petioles, sometimes subnitidous and usually drying grayish above, 7–12 cm. long, 2.5–5 cm. wide, the principal secondaries 6–12 pairs with an average distance near the middle of 7–10 mm., arcuate, the fainter ones often well obvious; inflorescence branches ascending to spreading, 2–5 mm. long, 6–15-flowered, the peduncle obsolete or 2–5 mm. long; calyx lobes 1.2–1.5 mm. broad, 0.9–1.3 mm. long, rounded to subacute; corolla tube about 1.5 cm. long, glabrous or more or less puberulent, usually finally much curved, the lobes 1–1.6 mm. long, 1 mm. wide, dorsally thicker, the spreading thin margin ciliate, glabrous to puberulent without, usually with a pubescent line at base within.—Probably extends into Peru from Brazil; cf. *L. Klugii,* which Markgraf referred here.

Peru (probably). Amazonian Brazil.

4. **AMBELANIA** Aublet

Neocouma Pierre, Bull. Soc. Linn. Par. n.s. 1: 33. 1898, fide Monachino.

Reference: Monachino, Lloydia 8: 109–130. 1945.

Smooth shrubs or small trees with opposite leaves, the deeply canaliculate petioles sometimes with minute glands in the axils, and axillary or terminal 2–many-flowered inflorescences of white to orange hypocrateriform flowers. Calyx lobes 5, glabrous as the corolla without, the latter sometimes pilose within. Anthers located below the middle of the tube, obtuse or subacute and extending into an acute appendage. Ovary superior, glabrous, 1- or 2-celled, the crested capitulum usually 5-lobed. Fruit a yellowish or brownish berry with many more or less flattened seeds, the small cotyledons only about one-third as long as the radicle.

The copious, sweet or bitter (but non-poisonous) latex, unlike that of *Couma* or *Lacmellea,* does not seem to show promise as a basic material in the manufacture of chewing gum (Monachino). No species, apparently, has yet been collected within Peru but at least two are known from near by, so that their occurrence is highly probable.

Inflorescences axillary........................*A. Markgrafiana.*
Inflorescences terminal........................*A. quadrangularis.*

Ambelania Markgrafiana Monachino, Lloydia 8: 122. 1945. *Neocouma Duckei* Mgf. Notizbl. Bot. Gart. Berlin 11: 337. 1932, not *A. Duckei* Mgf. l.c. 12: 296. 1935.

Branchlets mostly 6–7 mm. across; petioles 1.5–4 cm. long, fossate, rimmed at axil; leaves elliptic to lanceolate or oblanceolate, 17–30 cm. long, 7–15 cm. wide, usually (and very shortly) acuminate, subnitidous above, few if any known dots beneath, lateral nerves 16–20 pairs, to 2 cm. distant, the many tertiaries faint; axillary peduncles short or obsolete, the pedicels to 7 mm. long; calyx lobes 2–2.8 mm. wide, 2–2.6 mm. long; corolla tube about 1.5 cm. long, pubescent within to throat, the lobes about 11 mm. long, 3.5–4 mm. wide, pubescent at base within; anthers subsessile, 3.6–3.8 mm. long, the acumen 0.4–0.6 mm. long; style to ring 2.5–3 mm. long, the apiculi 1.4–1.9 mm. long; fruit (partially known) with minutely rugulose orange shell.—Simulates vegetatively *A. ternstroemiacea* (Muell. Arg.) Monachino, 123, which has been found as near Peru as the Putumayo; its branches are 7–15 mm. thick, leaves rounded or obscurely acuminate, secondaries 6–13 pairs.

Peru (probably). Colombia; Brazil.

Ambelania quadrangularis Muell. Arg. in Mart. Fl. Bras. 6, pt. 1: 18. 1860. *Rhigospira quadrangularis* (Muell. Arg.) Miers, Apocyn. S. Am. 68. 1878.

Branchlets acutely quadrangular, 4 or 5 mm. thick; petioles 1.5–2 cm. long; leaves broadly elliptic, 8–14 cm. long, 6–8 cm. wide, shortly acuminate, nitidulous unless beneath, the principal lateral nerves about 13 pairs with an average separation of 1.5–2 cm. near the middle, the many tertiaries prominent and the reticulations raised above; cymes terminal, many-flowered, the primary peduncle 5 or 6 cm. long, the pedicels to 6 mm. long; calyx lobes 1.2–1.6 mm. wide and long; corolla tube at least 1 cm. long, pubescent within to throat, the lobes about 7 mm. long, 2.7 mm. wide; anthers subsessile, pubescent at attachment, about 2.5 mm. long, the acumen 0.16 mm. long; ovary abruptly and markedly truncate apically, the style to ring 0.3 mm. long, the apiculi 0.5–0.8 mm. long.—After Monachino (as other descriptions), who notes the conspicuously truncate ovary as striking, the almost alate branchlets as unique. Found as near as São Paulo de Olivença and thus to be expected within Peru. Illustrated, Miers, l.c. *pl. 10*. F.M. Neg. 26843.

Peru (probably). To Venezuela.

5. COUMA Aublet

Reference: Monachino, Lloydia 6: 230–247. 1944.

Columnar-trunked trees with trigonous or subquadrate branchlets, whorled (ternate or quaternate) leaves, the petioles with a thick patellate gland, the blades with lateral nerves subequal and arcuate near margins, sometimes black-dotted beneath. Inflorescences soon obviously axillary. Calyx lobes usually 5, pubescent at least near margins within. Anthers inserted near or somewhat above middle of corolla tube, lanceolate, mucronate. Ovary glabrous, more or less inferior (at anthesis), and capped with carnose tissue, the stigma oblong to linear-lanceolate from a subcylindrical podium, the stigma lobes commonly hispidulous.

Notable for the palatable latex which is used as a basic material in the manufacture of chewing gum. See Monachino, l.c. 244–247, for an extensive bibliography, including economic works pertaining to *Couma* and *Parahancornia.*

Couma macrocarpa Barb. Rodr. Vellosia, ed. 2, 1: 32, *pl. 1, fig. B.* 1891; 234.

Branchlets stout, densely puberulent to glabrous; petioles about 1.5 cm. long, puberulent; leaves broadly ovate, cordate, truncate to subacute at base, abruptly acuminate—acumen to 4 cm. long—often 1–3 dm. long or longer, 6–15 cm. wide or wider, usually glaucescent and spreading puberulent beneath at least on the lateral nerves, these about 20 pairs, the fine reticulation uniformly marked; inflorescences expanding before foliation, the many more or less pubescent flowers rose-colored; calyx lobes suboblong-ovate or -lanceolate; corolla tube densely pilose within medially and at throat but glabrous between these areas; ovary deeply depressed and furrowed, the stigma lobes shorter than 0.5 mm., typically obtuse, glabrous. —Seems to be weakly distinguishable from *C. guianensis* Aublet, 235, with petioles 5–15 mm. long, leaves 9.5–25 cm. long, 4.5–11 cm. wide, secondary nerves 13–15 pairs. Sometimes attains 40 meters, the straight gray to dark brown smooth trunk unbranched for half its height. Illustrated, Am. Journ. Bot. 22: 593, *pl. 1* (as *C. guatemalensis* Standley) (race or species with acute stigmas).

An important source of latex for gum.

Loreto: Upper Río Nanay, *Williams 912.* Caballo-cocha, *Williams 2100.* Iquitos, *Bliss 235; Klug 124.* Mouth of Río Santiago, *Tessmann 4155.* To Central America and British Guiana. "Leche caspi," "fransoca," "osurba," "perillo."

6. RAUVOLFIA [Plumier] L.

Reference: A. S. Rao, Ann. Mo. Bot. Gard. 43: 253–254. 1956.

In Peru mostly slender-trunked sometimes tall trees or shrubs with verticillate branches and leaves, these often inequilateral, and mostly salverform white or tinted flowers borne loosely in interpetiolar and terminal cymes (dichasia). Calyx eglandular; glands present in leaf-axils, sometimes on the petioles. Corolla esquamellate, the 5 equal lobes contorted, the 5 stamens free. Ovary 1–2 ovulate, sunk into a low annular or cupuliform disk. Fruit apocarpous or variously syncarpous drupes, broadly obovoid or obcordate, often only 1 carpel developing, the albuminous seeds with membranous testa, linear hilum. —The original spelling is as written; the altered form, Rauwolfia, proposed in Germany, has become established in medical and popular literature, where it properly may be perpetuated as the English or universal common name, as, for example, in the recent book, *Rauwolfia: Botany, Chemistry and Pharmacology*, by Woodson, *et al.*

In acknowledging my direct compilation from the recent commendable review by Dr. Aragula Sathyanarayana Rao I congratulate him especially on the scholarly character of his work.

Reserpine, the active compound in Rauwolfia and an ancient Hindu remedy for high blood pressure and mental diseases, has been used recently with great success combined with hexamethonium and, preferably, with the related pentolinium, according to F. Horace Smirk of the University of Otago, New Zealand; it is now obtained commercially from the African *R. vomitoria* and the American *R. tetraphylla* (cf. also the work cited above).

Corolla 1–2 cm. long; petioles not glandular except at base, the nodal leaves (Peru) very unequal only in *R. Sprucei;* fruit apocarpous or variously syncarpous (section *Macroviffia*).
  Leaves membranous or chartaceous, the lateral nerves 1–1.5 cm. distant.
    Leaves ovate, to about 1 dm. long, often clearly unequal in each whorl of 4 (3–5) .... *R. Sprucei.*
    Leaves lanceolate or obovate, mostly longer than 1 dm., more or less unequal.
      Leaves elliptic-obovate, 4–5-verticillate, lateral nerves parallel. *R. pentaphylla.*
      Leaves oblong-lanceolate, 3-verticillate or paired, the nerves arcuate .... *R. andina.*
  Leaves coriaceous.
    Lateral nerves about 5 mm. distant, flowers many, tube straight. *R. praecox.*
    Lateral nerves about 1 cm. distant; flowers few, tube inflated. *R. sanctorum.*

Corolla 5.5 mm. long; petioles more or less glandular, the nodal leaves very unequal; fruit fully syncarpous (section *Rauvolfia*).
R. tetraphylla.

Rauvolfia andina Mgf. Repert. Nov. Sp. 20: 122. 1924; 323.

Glabrous, the brown branches terete; intrapetiolar glands few, none on the petiole, this 2–3 cm. long; leaves 3–4 verticillate, elliptic-oblong or -lanceolate, attenuate to base, acuminate, about 1–2 dm. long, 2–5 cm. wide, membranous-chartaceous, the arcuate lateral nerves to about 1 cm. distant, rather prominent beneath, indistinctly joined marginally; peduncles 1–5 cm. long, the cymes many-flowered; pedicels about 5 mm. long; calyx lobes lanceolate acuminate, 1.5–2.5 mm. long, glandular-dentate; corolla constricted at throat, sparsely pilose below the subsessile anthers, these ovate, acute; tube about 1 cm. long, 1.5 mm. thick at base, the lobes linear, 5–6 mm. long, 1–1.5 mm. wide; stigma little dilated, ring of trichomes at base, 2-apiculate; drupes obcordate, 1 cm. high and broad, about 5 mm. thick, with 2 seeds.—Known as a shrub 5–7 meters tall. *R. Schneli* Speg. (*R. boliviana* Mgf. l.c., fide Rao) has leaves 3 times as long as wide, half as long flowers, the throat villous. Illustrated, Rao, 323.

Cajamarca: Pamahuaca on a branch of the Río Huancabamba, *Weberbauer 7112*, type. San Miguel, *Ferreyra 7086* (det. Rao).

Rauvolfia praecox Schum. ex Mgf. Repert. Nov. Sp. 20: 119. 1924; 343.

Glabrous including the reddish-blue flowers without, the branches gray; intrapetiolar glands few; petioles 2–3 cm. long, 3–4-verticillate; leaves narrowly elliptic, long-attenuate to base, shortly acuminate to acute, 6–15 cm. long, 2–5 cm. wide, coriaceous, somewhat lustrous above, the 10–15 lateral nerves about 5 mm. distant, prominently reticulate with the veins; cymes terminal, paniculate, precocious (on basis of type), the 2–3 branches strongly divaricate, about 1 dm. across; peduncles 2–4 cm. long, pedicels 6–9 mm. long; calyx lobes scarcely 1 mm. long, acute; corolla salverform, tube (5) 7–8 mm. long, 1 mm. thick, sparsely setose-pilose within, the linear-lanceolate, ovate (Rao) lobes 4–6 mm. long, 1.5 (–2) mm. wide; stamens below the throat subsessile, apiculate; stigma broadly cylindric, with broad basal annulus; ovary 1 mm. high.—Attains 30 meters. Illustrated, Rao, 344. F.M. Neg. 4474.

Cajamarca: Río Huancabamba, *Weberbauer 7115?* (young).—Loreto: Near Iquitos, *Ule 6256*, type. Amazonian Brazil; Bolivia.

Rauvolfia sanctorum Woods. Ann. Mo. Bot. Gard. 18: 542. 1931; 325.

A glabrous tree 3–4 meters tall with lax slender terete branches, the pectinate glands only in the leaf-axils; petioles stout, 1–3 cm. long, the somewhat unequal elliptic leaves in verticils of 3 (–4), cuneate at base, acuminate, about 1–2 dm. long, 3–8 cm. wide, coriaceous, the arcuate lateral nerves equally prominent on both sides; inflorescence terminal; peduncles 2–5 cm. long; bracts ovate, acute; pedicels 4–8 mm. long; calyx lobes ovate, acuminate, about 1.5 mm. long; corolla infundibuliform, white, the tube 10–12 mm. long, about 1.5 mm. thick, pilose only near tip and base of stamens, the throat dilated at stamen insertion, 2–3 mm. below orifice, the obovate-oblong lobes 4 mm. long; anthers ovate, acuminate; ovary bicarpellate; fruit reniform, 2-seeded, lobes 13–15 mm. high, 7–9 mm. broad, the broadly ellipsoid faintly rugose stones little compressed.—Illustrated, Rao, 326.

Loreto: Mishuyacu, (*Killip & Smith 29928*, det. Rao). Colombia.

Rauvolfia Sprucei Muell. Arg. in Mart. Fl. Bras. 6, pt. 1: 34. 1860; 308. *R. lauretiana* Woods. Ann. Mo. Bot. Gard. 18: 541. 1931, fide Rao.

Glabrous tree (except corollas within) but the striate terete branchlets sparsely lenticellate; petioles 1.5–2 (3.5) cm. long, eglandular, usually quaternate; leaves membranous, ovate to rhombic-ovate, abruptly attenuate at base, acute to long- (and obtusely) acuminate, sometimes notably unequal, the larger 9 or 10 (15) cm. long, about half as wide, the smaller 5–8 cm. long, 3–5 cm. wide; lateral nerves 7–10 pairs, very distinct beneath; cymes terminal, often many-flowered, the peduncles 1–4 cm. long, dichotomous, the pedicels 5–12 mm. long, the squamose bracts minute or ovate, acuminate, 1.5 mm. long (Rao); calyx lobes broadly deltoid, rounded, 1.5 mm. long, 2–2.5 mm. wide, ciliolate; corolla tubular, whitish, crimson-streaked, about 1 (–2) cm. long, throat 2 mm. across, glabrous without, sparsely pilose, thin, the lobes obovate, subobtuse, 5 (–8) mm. long; anthers ovoid, acuminate, not at all appendaged or with a callosity at insertion point (Rao); ovary bicarpellate, cylindric, sulcate; fruits reniform, bilobed or, if only 1 carpel develops, ovoid, 2–2.5 cm. high, about 1.5 cm. broad, the ovate compressed stones obscurely rugose.—The type of *R. lauretiana* was also referred by Markgraf to *R. Sprucei* Muell. Arg. of the Río Negro, that as to type, however, with subcoriaceous leaves mostly in fives, corolla tube 1.5 cm. long.

Fruit of the Mexia specimen obcordate, about 3 cm. high and broad, probably 1 cm. thick. Illustrated, Rao, 309.

San Martín: Tarapoto, *Spruce 3856*.—Loreto: Mishuyacu near Iquitos, *Klug 35* (type, *R. lauretiana*); *Tessmann 5107*. Rancho Indiana, *Mexia 6415* (fruiting). Amazonian Brazil.

Rauvolfia pentaphylla [Huber] Ducke, Archiv. Jard. Bot. Rio Jan. 3: 244. 1922; 314. *R. Duckei* Mgf. Repert. Nov. Sp. 20: 121. 1924, fide Rao.

Glabrous, the terete branches gray, the (4-) 5-verticillate leaves unequal, elliptic to obovate-lanceolate, abruptly narrowed to petiole (this 1.5–3 cm. long), subobtuse or shortly acuminate (Peru), the largest 1–1.5 dm. long, less than half as wide, the smallest 4–7 mm. long, 2–3 cm. wide, all chartaceous to coriaceous, the 13–16 (20) lateral arcuate nerves about 1–1.5 cm. distant, joined marginally, rather prominent on both sides; inflorescence many-flowered, the geminate peduncles to 6 cm. long; pedicels slender to filiform, 2–6 mm. long; flowers whitish, purple-dotted, the calyx lobes 1.5 mm. long, acute, the corolla tube 12–18 mm. long, rather densely pilose-villous within the slightly dilated throat, the ovate obtuse lobes 6–12 mm. long; anthers ovate, dorsally calloused; ovary cylindric, bicarpellate, the disk annular; drupes subglobose, 2.5–3 cm. high, the 2 stones 2–2.5 cm. long, half as wide, obscurely rugose, the seed little compressed. —Small tree with spreading crown, round slender trunk, the dark brown bark with many short coarse ridges (Williams); known to attain 25 meters. The Peruvian collections apparently were not seen by Rao, so their determination may be questioned. Illustrated, Rao, 315.

Loreto: Pebas, *Williams 1915* (det. Markgraf). Iquitos, *Williams 8060*. Amazonian Brazil. "Chiric-sanango" (Williams).

Rauvolfia tetraphylla L. Sp. Pl. 208. 1753; 285. *R. hirsuta* Jacq. Enum. Pl. Carib. 14. 1760. *R. canescens* L. Sp. Pl. ed. 2. 303. 1762.

Typically more or less pubescent, the indument of the leaves soft, that of the inflorescence a puberulence, or sometimes entirely glabrous; petioles glandular, 1–7 mm. long, commonly in whorls of 4 (3 or 5); leaves very unequal, narrowly oblong, broadly ovate- or obovate-elliptic, broadly acute to obtuse at base, the largest 2–11 (15) cm. long, 2–4 cm. wide, the smallest 1–4 cm. long, 0.8–3 cm. wide (Rao), membranous, the veins obscure or distinct and closeknit (Rao); inflorescence usually compact; pedicels 2–3 (5) mm. long; calyx lobes ovate, acute, about 1 mm. long, corolla urceolate, tube 2–3 mm. long, about 1.5 mm. across at base, the rounded erect lobes about 1 mm. long; stamens inserted at slight constriction of tube, the anthers ovate, acute; ovary 2-carpellary, syncarpous; drupes not or obscurely emarginate, 5–8 mm. thick, finally black, the 2 ovoid stones flattened ventrally, convex dorsally, rugose.—Often much-branched, usually a meter or so tall; includes also *R. canescens* L. vars. *glabra* Muell. Arg. and *tomentosa* Muell. Arg.; cf. Rao, l.c. 255, who quotes Rendle, Proc. Linn. Soc. Lond. 149: 106. 1937, regarding synonymy. Williams' collections not verified. Illustrated, Rao, 286 and opposite 354, photos of historical illustrations.

Piura: Chaura, (*Ferreyra 10949*).—Amazonas: Bagua, (*Diaz*).—Lambayeque: Chiclayo, (*Ferreyra 7610; Lopez Miranda 288*). Pelillo, (*Soukup 4198*).—La Libertad: *Raimondi 741*.—San Martín: Juan Guerra, *Williams 6837*. Bella Vista, (*Ferreyra 10085*). Tarapoto, *Williams 5775*.—Loreto: Santa Lucía, (*Ule 6805*). To southern Mexico and West Indies.

7. CONDYLOCARPON Desf.

Rhipidia Mgf. Notizbl. Bot. Gart. Berlin 10: 1033. 1930, fide Ducke, Trop. Woods 76: 28. 1943.

Slender-branched lianas with small membranous decurrent or verticillate leaves and many almost minute flowers in terminal long-peduncled corymbs. Calyx lobes obtuse, eglandular but glandular punctate. Buds globose, the appendaged corolla lobes strongly oblique, the tube constricted below the throat, the ovate anthers inserted near the middle. Stigma globose; no disk. Ovary apocarpous. Fruit ligneous, compressed, filiform and not articulate or articulate into indehiscent 1-seeded sections parting at maturity.—Aspect suggests *Forsteronia; R. amazonica* Mgf. (fig. 18) is remarkable in its filiform pilose fruits, 1 dm. long, the single-seeded portion 2 cm. long.

Condylocarpon pubiflorum (Benth.) Muell. Arg. in Mart. Fl. Bras. 6, pt. 1: 67. 1860.

A small tree with reddish brown bark, the inner fibrous; branchlets more or less hirsute; petioles 4–5 mm. long; leaves elliptic, rounded at base, abruptly and acutely short-acuminate, mostly about 8 cm. long, half as wide, lustrous above, finely reticulate-veined, the subparallel lateral nerves joined near ciliate margins; cymes nearly as long as leaves, the ultimate branchlets densely squamose-bracteate, the ovate bracts fulvous sericeous; pedicels as flowers 2–4 mm. long; calyx segments ciliate; corolla lobes circinately involute at anthesis, oblong-ovate, subacute, eglandular. F.M. Neg. 4403.

Loreto: Caballo-cocha, *Williams 2011.* Iquitos, *Williams 3770* (det. Markgraf). Amazonian Brazil.

8. VALLESIA R. & P.

Shrubs or small trees, the alternate leaves with a stipular dentate gland, the lateral inflorescence of few–many greenish-white flowers umbellate-cymose, sometimes dichotomous. Calyx lobes essentially equal, without scales. Corolla salverform, sinistrorsely contorted. Anthers not connivent, the connective not enlarged. Ovary apocarpous, nectary lacking, usually only 1 carpel developing, the fruit drupaceous.

Vallesia glabra (Cav.) Link, Enum. Hort. Berol. 1: 207. 1821. *Rauwolfia glabra* Cav. Ic. 3: 50, *pl. 297.* 1796. *V. dichotoma* R. & P. Fl. Peruv. 2: 26, *pl. 151.* 1799. *V. chiococcoides* HBK. Nov. Gen. & Sp. 3: 233, *pl. 241.* 1819.

Clambering shrub or tree, usually 2–3 meters tall with greenish-yellow leaves and flowers, the former ovate-oblong, acute or acutely acuminate, subacute or rounded at base, to about 7 cm. long, 2.5 cm. wide, the latter to about 6 mm. long on pedicels to 4 mm. long; convolute lobes of the bud broadly conic; corolla tube 3–4 mm. long, dilated at stamen-insertion, much constricted at orifice, the ovate lobes erect; drupes opalescent, the seeds, including the stony layer of the endocarp, 9–10 mm. long.—Svenson, Am. Journ. Bot. 33: 473. 1946, reported finding flowers and fruits together in late February in adjacent Ecuador. Typically glabrous but sometimes pubescent (*V. pubescens* Anderss.). Common and drought-resisting (Stork & Horton); type of *V. dichotoma* from Ica at 300 meters.

Cajamarca: Bellensta, *Weberbauer 6205* (distr. as *V. chiococcoides* HBK.). Jaén de Bracamoros, *Bonpland* (type, *V. chiococcoides*).—Lambayeque: Near Chiclayo, *Soukup 3910.*—La Libertad: Chepén, Prov. Pacasmayo, *Stork & Horton 10009* (det. Standley); also by Diels.—Ica: Near Ica, *Weberbauer 7195; Ruíz & Pavón,* type.—Apurímac: Río Pinkos, 1,200 meters, *Weberbauer 5858.* To western Mexico, Argentina and Galapagos. "Cuncun" (Soukup).

9. **ASPIDOSPERMA** Mart. & Zucc.

Reference: Woodson, Ann. Mo. Bot. Gard. 38: 119–206. 1951.

Trees, with alternate or approximate (rarely decurrent or ternate), estipulate pinnate-nerved leaves and determinate dichasially cymose to aggregate-dichasial and thyrsiform inflorescence, the secondary peduncles often umbellately fasciculate. Calyx lobes usually 5 and free, rarely 4, the 2 outermost larger and connate, the inner free, included. Corollas salverform to tubular, the tube fissured behind the anthers, the lobes reflexed to erect in anthesis. Stamens inserted medially or higher, the 2 thecae of the mucronulate anthers uniformly fertile, each 2-celled, the outer cell slightly longer. Carpels sometimes apparently glandular toward base but without defined disk; ovules peltate, 2–32 in 2–6 series on a thin ventral placenta; style more or less elongate, the stigma variously clavate to subcapitate. Follicles usually strongly compressed and more or less ligneous, nearly circular to foliciform or dolabriform, the peltate much-flattened seeds with a papery concentric or strongly excentric wing. Species apparently evergreen unless *A. macrocarpon* and *A. Vargasii.*

Woodson's recent review of the genus is obviously a distinguished work; his discussion of characters is a scholarly presentation of the taxonomic problems within the group and could be highly recommended reading for students generally as an example of lucid, practical and thoughtful expression of botanical research in classification. Among the authors contributing to his knowledge may be noted here Pichon's "perspective of the genus," Bull. Mus. Nat. d'Hist. Nat. sér. 2, 19: 362. 1947, and Milanez, Physis 15: 428. 1939 (based on wood anatomy). The timbers of many species are described in Record & Hess, *Timbers of the New World,* 58–62. 1943. See also Ducke, Ann. Acad. Bras. Cienc. 27: 381–384. 1955, for a description of growth habits of several species, including, in Peru, *A. rigidum* Rusby.

ASPIDOSPERMA, TECHNICAL KEY (after Woodson)

Corollas typically salverform, the lobes reflexed or spreading horizontally, the tube often constricted at orifice; bracts obsolete or present irregularly.
  Corolla tube clearly constricted; bracts obsolete.
    Corollas to 16 mm. long; follicles dolabriform, seeds with complete wing, circular.......................*A. macrocarpon.*
    Corollas to 5.5 mm. long; follicles subelliptic, seeds with wing ovate....................................*A. Vargasii.*

Corolla tube not clearly constricted; bracts obscure or irregularly persisting; follicles broadly dolabriform, seeds with circular wing . . . . *A. rigidum.*

Corollas tubular or tubular-salverform, the lobes erect or nearly at anthesis, tube not constricted; bracts more or less persisting, or caducous.

Corolla tube essentially terete, lobes not abruptly caudate; inflorescence neither whorled nor fastigiate.

Corollas to about 5 mm. long, glabrous or merely puberulent; follicles smooth, lenticellate, seeds with narrow excentric basal wing.

Inflorescences approximate; follicles clavate-oblong. *A. polyneuron.*

Inflorescences solitary, usually terminal; follicles subreniform. *A. cuspa.*

Corollas to about 2.5 cm. long, densely sericeous; follicles broadly dolabriform, spinose, seed wing circular . . . . . *A. inundatum.*

Corollas about 6.5 mm. long, tomentulose; follicles suborbicular, verrucose, seed wing circular . . . . *A. Marcgravianum.*

Corolla tube callose-angled, lobes caudate; primary inflorescence branches usually whorled or fastigiate . . . . *A. Steinbachii.*

ASPIDOSPERMA, ARTIFICIAL KEY

Corollas 2.5 cm. long; bracts conspicuous; follicles spinose. *A. inundatum.*

Corollas 1–1.5 cm. long; bracts obscure or partly persisting; follicles smooth.

Leaves often subcaudate-acuminate; follicles subrotund, to 4.5 cm. across . . . . *A. rigidum.*

Leaves obtuse or obtusely short-acuminate; follicles 6–12 cm. across.

Corollas about 1.5 cm. long; inflorescence subumbellate; follicles puberulent . . . . *A. macrocarpon.*

Corollas about 1 cm. long; inflorescence corymbose, first branches whorled; follicles tomentulose . . . . *A. Steinbachii.*

Corollas 5–6.5 mm. long; bracts more or less obvious; follicles smooth or verrucose.

Leaves obtuse, obtusely short-acuminate or acute, often about a third as wide as long.

Inflorescence in uppermost axils; follicles clavate-oblong, to 6 by 1.5 cm.................................*A. polyneuron.*
Inflorescence usually terminal and solitary; follicles subreniform-suborbicular.
  Corollas glabrous or puberulent; follicles to 4 by 2 cm. *A. cuspa.*
  Corollas tomentulose; follicles 4–6 cm. across. *A. Marcgravianum.*
Leaves shortly acuminate, half as wide as long; follicles pyriform, to 5 by 3 cm................................*A. Vargasii.*

Aspidosperma cuspa (HBK.) Blake ex Pittier, Man. Pl. Us. Venez. 110. 1926; 162. *Conoria? cuspa* HBK. Nov. Gen. & Sp. 7: 242. 1825.

Shrubs or trees sometimes 8 meters tall with solitary usually terminal monochasial inflorescence, the bracts (1–3 mm. long) persistent, the flowers sessile; branches slender, glabrous or rarely densely puberulent; petioles 2–9 mm. long; leaves narrowly oblong-elliptic to broadly oval or ovate, obtuse or rounded at both ends, 2–13 cm. long, about 1–8 cm. wide, glabrous or infrequently more or less puberulent, opaque or lustrous, somewhat glaucous beneath, veins prominently reticulate on both sides; inflorescences rather thyrsiform, 1–3 cm. long, sometimes apparently lateral and axillary or extra-axillary, densely papillate or puberulent even the broadly ovate obtuse calyx lobes, these 1 mm. long; corollas greenish-yellow or white, glabrous, the tube 2.5–3 mm. long, about half as wide at submedial insertion of stamens, the broadly ovate obtuse lobes 1–1.5 mm. long; anthers about 1 mm. long, ovary ovoid, glabrous, 0.5 mm. long, the fusiform stigma 0.3 mm. long; follicles subreniform, acute or rounded at tip, 2–4 cm. long, half as wide, lenticellate, glabrous or papillate, the midrib prominent; seeds 2.5–3.5 cm. long, 1–1.5 cm. wide, the obtuse basal wing about as long as the bilaterally asymmetric cotyledons.—Variable in leaf-size, indument and position of inflorescences (Woodson). Illustrated, Woodson, l.c. 161, *fig. 7* (branch, fruit). F.M. Negs. 4411 (*A. dicipiens* Muell. Arg.); 4420 (as *A. Lhotzkianum*).

Peru (probably). Ecuador and Colombia to Haiti, Trinidad and Brazil.

Aspidosperma inundatum Ducke, Archiv. Gard. Bot. Rio Jan. 3: 245. 1922; 167. *A. acanthocarpum* Mgf. Notizbl. Bot. Gart. Berlin 14: 128. 1938?

Branches early, leaves beneath and inflorescences even to the corollas without densely if minutely brown tomentulose; petioles 1.5–2 cm. long; leaves ovate to broadly oblong-elliptic, obtuse at base, broadly acute to shortly acuminate, 7–16 cm. long, 2.5–7 cm. wide, glabrous and somewhat lustrous above, more or less coriaceous; inflorescences both terminal and lateral to the leafy branches, stout, corymbose-thyrsiform, 4–9 cm. long, the pedicels about 2 mm. long, the bracts conspicuous; calyx lobes broadly ovate, acute, 2.5–3 mm. long; corolla white, the tube about 9 mm. long, 2.5 mm. thick at submedial insertion of stamens, the narrowly lanceolate-elliptic lobes 15–16 mm. long; anthers about 2 mm. long; ovary ovoid, tomentulose, the stigma narrowly cylindric; follicles densely and stoutly spinose, nearly circular, 3.5–4 cm. in diameter, stout stipe about 5 mm. long; seeds circular, 3–4 cm. in diameter.—Fruit of type unknown, so Ducke and Markgraf names may apply to different trees; type of latter from upper Amazon so to be expected in Amazonian Peru; similar species known from regions adjacent to Peru include *A. Schultesii* Woods., 168, corolla about 13 mm. long, leaves heavy coriaceous; *A. megaphyllum* Woods., 168, corolla 1.5 cm. long, the lobes and tube subequal, leaves heavy, and *A. carapanauba* Pichón, 169, corollas about 11 mm. long, the ovate lobes half as long; fruit of all these, however, unknown. More distinctive, apparently, and from as near as southwestern Ecuador is *A. myristicifolium* (Mgf.) Woods., 169, with native name "naranjo de monte," with membranous or chartaceous leaves, lateral inflorescence, corolla 12 mm. long, the oblong lobes and tube equal, follicles sessile, broadly dolabriform, 11 or 12 cm. long and broad, densely brown velutinous. Ducke wrote that *A. inundatum* is not a "carapanauba." F.M. Neg. 4417.

Peru (probably; or related species as noted above). Amazonian Brazil. "Carapanauba" or "maparana" (Ducke).

Aspidosperma macrocarpon Mart. Nov. Gen. & Sp. 1: 59. 1824; 138.

Becoming a rather large tree (known to 25 meters tall) with thick corky bark or that of the slender branches thin, rimose; lenticels not conspicuous; petioles 1–4 cm. long; leaves alternate, elliptic, obtuse at both ends, 10–17 cm. long, 5–8 cm. wide, firm-membranous, glabrous to more or less yellow-pubescent, the lateral nerves widely arcuate, the veins reticulate beneath; inflorescences subterminal, subumbelliform, several-flowered, to about 3.5 cm. long, densely ferrugineous (or yellow) puberulent-tomentose as the ovate acuminate calyx lobes, these subequal, 2–4 mm. long; pedicels 1–2 mm. long; bracts obsolete; corollas white, appressed sericeous to yellow tomentose, the tube 6 or 7 mm. long, about a third as wide at the insertion of stamens, somewhat constricted at base and orifice, nearly glabrous within, the oblong-elliptic lobes 7–9 mm. long; anthers about 1.5 mm. long; ovary glabrous or tomentulose, stigma narrowly ovoid to subreniform; follicles semicircular to dolabriform, 9–14 cm. long, 8–12 cm. wide, in stout stipes 3 cm. long, the dark pericarp irregularly striate, puberulent, the circular seeds about 8 cm. in diameter. —Probably extends into adjacent Peruvian areas. Illustrated, Woodson, l.c. 139 (*fig. 4*, flowering branch, fruit). F.M. Negs. 4413 (as *A. Duckei*); 4512 (as *A. Snethlagei*).

Río Acre: Mouth of Río Macauhán, *Krukoff 5682.* Central Brazil to Bolivia and Venezuela.

Aspidosperma Marcgravianum Woods. Ann. Mo. Bot. Gard. 38: 170. 1951.

Large tree, 20–60 meters tall, the glabrous branchlets strongly lenticellate, the puberulent thyrsiform inflorescences terminal; petioles about 1–2 cm. long; leaves ovate- or oblong-elliptic, broadly obtuse or rounded at base, acute or obtuse, 6–14 cm. long, 2–5 cm. wide, firm-membranous, glabrous and opaque above, minutely papillate or glabrous beneath; bracts minute; flowers sessile; calyx lobes unequal, ovate or broadly oblong-ovate, obtuse, 2–3 mm. long, minutely tomentulose without as the greenish corolla, this with tube 5 mm. long, 1.5 mm. thick, lobes ovate, acute, 1.5 mm. long; anthers near corolla throat 0.6 mm. long; ovary glabrous, ovoid, sulcate, the fusiform stigma 1 mm. long; follicles nearly orbicular, verrucose, 4–6 cm. in diameter.—Known from several areas about Peru this widely distributed species will probably be found also in that country. The somewhat similar *A. myristicifolium* (Mgf.) Woods., 169, from adjacent Ecuador, has corollas 12 mm. long, tube and oblong lobes subequal, larger somewhat obovate leaves; type by Tafalla of the Ruíz and Pavón Expedition.

Peru (undoubtedly). To Bolivia and Surinam. "Carapanauba," "naranjo" (Tafalla).

Aspidosperma polyneuron Muell. Arg. in Mart. Fl. Bras. 6, pt. 1: 57. 1860; 158.

Attaining 20 meters, the trunk to 8 dm. in diameter, the bark conspicuously lenticellate; branches slender with scaly acuminate buds, the subtending internode with definite seasonal articulations; petioles alternate, mostly 1–1.5 cm. long; leaves oblong-obovate-elliptic, base acutely cuneate to obtuse, shortly and abruptly acuminate to obtuse or rounded, 4–12 cm. long, 1–4 cm. wide, firm-membranous, prominently reticulate-veined on both sides; inflorescences in the uppermost axils, gray puberulent, 1–3 cm. long, the pedicels 1 mm. long, the bracts minute; calyx lobes broadly ovate, acute to rounded, appressed pilosulous as the whitish or yellowish corolla or this nearly glabrous, its tube 2.5–3 mm. long, about 1 mm. broad at insertion, the ovate lobes 0.5–1.5 mm. long; ovary densely puberulent; follicles clavate-oblong, 3–6 cm. long, 1–1.5 cm. wide, conspicuously lenticellate, the seeds 2–3.5 cm. long, the obtuse basal ring and radially symmetric cotyledons subequal.—F.M. Negs. 22254; 20136.

Produces excellent structural timber, the heartwood pink or orange, the sapwood dull gray-white (Dugand).

Cajamarca: Near Las Huertas, Prov. Jaén, *Weberbauer 7115.* Colombia to Paraguay and Argentina.

Aspidosperma rigidum Rusby, Mem. N. Y. Bot. Gard. 7: 323. 1927; 164.

Tall (8–40 meters), with conspicuously lenticellate bark, the slender branches with naked obtuse buds without definite seasonal articulations, the cymose inflorescences either terminal or lateral to the leafy branches, or both; leaves ovate- to oblong-elliptic, broadly decurrent to petiole (this 0.5–1.5 cm. long), subcaudate-acuminate, 6–15 cm. long, 2–6 cm. wide, firm-membranous, opaque, glabrous, with rather indistinct venation; cymes dichotomous, more or less pilosulous, 3–4 cm. long, the pedicels 2–3 mm. long, bracts obscure; calyx lobes ovate, obtuse or acute, 1–1.5 mm. long; corolla greenish-white, glabrous, the tube 2–3 mm. long, the oblong-elliptic reflexed lobes 5–7 mm. long; stamens medially inserted, the anthers scarcely 1 mm. long; ovary oblongoid, glabrous, the stigma minutely capitate; follicles nearly circular, sessile or very shortly stiped, 3–4.5 cm. across, smooth, glabrous, the midrib very excentric; seeds circular or broadly oval, about 4 cm. in diameter.—Illustrated, Woodson, l.c. 165, *fig. 8.*

Discovered on Rios Solimöes and Acre, Brazil, (*Krukoff 5642*). No doubt occurs within adjacent Peru; timber, according to Krukoff, of excellent quality.

Peru (undoubtedly). Bolivia to Amazonian Brazil. "Carapanahuba" (Brazil).

Aspidosperma Steinbachii Mgf. Notizbl. Bot. Gart. Berlin 9: 1158. 1927; 188.

Trees (known to attain 20 meters) with close hard bark, not obviously lenticellate at maturity, the essentially glabrous branches without definite articulations; leaves alternate but approximate (petioles 2–3 cm. long), broadly ovate-oblong to narrowly oblong-elliptic, base rounded to narrowly cuneate, obtuse to rounded or obtusely short-acuminate, 8–17 cm. long, 2–7 cm. wide, membranous or pergamentaceous, glabrous (or early papillate beneath), lustrous above, the innumerable veins apparent on both sides; inflorescences tomentulose, including the ovate-elliptic acute 3 mm. long calyx lobes, crowded subterminally, broadly corymbose, 12–15 cm. long, the secondary peduncles umbellately congested, pedicels 1 mm. long, bracts obvious; corolla glabrous without, the tube 4–4.5 mm. long, the ovate-linear caudate lobes about as long, lightly spiralled in bud; anthers 1 mm. long; ovary glabrous; follicles broadly elliptic to nearly circular, 7–10 cm. long, 6–9 cm. broad, abruptly narrowed to slender stipe 4 or 5 cm. long, densely black tomentose; seeds broadly oval or circular, 6–9 cm. in diameter.—*A. album* (Vahl) R. Benoist, 194, may extend into Peru from the upper Amazon and is rather similar, but the determinate branches of the cymose inflorescence are much shorter than the divaricate lateral ones. F.M. Neg. 4431.

San Martín: Tarapoto, *Williams 5816*. "Pinchi-caspi" (Williams). Bolivia.

Aspidosperma Vargasii A. DC. Prodr. 8: 399. 1844; 154.

Tree, the bark conspicuously lenticellate; branches slender, the bark thin; petioles 1–1.5 cm. long; leaves elliptic to obovate, obtusely to acutely cuneate basally, shortly acuminate, 5–12 cm. long, 3–6 cm. wide, firm-membranous, glabrous; inflorescences at the uppermost nodes, dense, closely puberulent, 2–5 cm. long; pedicels about 1 mm. long; calyx lobes ovate, acute, 2 mm. long, corolla white, pilosulous, the tube 3.5–4 mm. long, 1 mm. across, the ovate obtuse lobes 1.5 mm. long; ovary densely puberulent, the ovoid stigma about half as long (0.5 mm.); follicles pyriform, 4–5 cm. long, 2.5–3 cm. wide, gradually narrowed to stipe 5–10 mm. long, with well-defined midnerve; seeds ovate, 4 cm. long, 2.5 cm. broad.—Known to attain 20 meters; simulates the closely related *A. pyricollum* Muell. Arg. of southern Brazil with oblanceolate to obovate leaves, to which Woodson at some time referred *Williams 6231*, in herbarium. Here might be sought *A. Ulei* Mgf., 154, of northern Brazil, with which *A. Var-*

gasii may hybridize (Woodson); its corolla tube is nearly half as broad as long, the follicles subellipsoid. Named for the collector, the type from Caracas.

Highly esteemed for general carpentry (Williams); twigs brittle, latex slightly bitter (Woytkowski).

San Martín: Tarapoto, *Williams 6231* (det. Woodson, 1951).—Huánuco: Shapajilla, *Woytkowski 26*.—Loreto: Río Santiago, *Tessmann 4619* (distributed as *A. subincanum*). To Surinam. "Quillobordon" (Williams).

10. LAXOPLUMERIA Mgf.

Bisquamaria Pichón, Bull. Mus. Hist. Nat. Paris, sér. 2, 19: 299. 1947, fide Monachino.

Reference: Monachino, Phytologia 3: 67–70. 1949.

Somewhat lactiferous trees, the alternate leaves crowded toward the tip of the flowering branches, the many-flowered inflorescences axillary or apparently terminal. Bracts minute. Calyx eglandular. Corolla tube cylindric, shorter than the linear slightly sinistrorse lobes. Anthers free, completely dehiscing. Ovary apocarpous and with a low basal annular disk with two lobes opposite the carpel-sutures; ovules many, in 3–6 series. Style filiform, the clavuncle indusiate above, tunicate below, the conic apiculi acute. Fruit follicular, elongate (two mericarps), with many flat long-pubescent seeds.—After Monachino, who first described the ovary as apocarpous, observed the presence of the disk, and placed the genus with the "Plumieroideae-Plumiereae-Alstoniinae" of Schumann, Naturl. Pflanzenfam. 4, Abt. 2: 135. 1895.

Laxoplumeria Tessmannii Mgf. Notizbl. Bot. Gart. Berlin 9: 981. 1926; 67.

Type a scarcely lactescent slender tree 30 meters tall, branching at 17 meters, glabrous except the sparsely puberulent inflorescence; petioles 2–3 cm. long, canaliculate, subulate, glandular; leaves obovate, long-cuneate to base, rounded at apex or obscurely or very shortly acuminate, this tip itself rounded, 1.5–2 dm. long, 5–7 cm. wide, subcoriaceous, somewhat lustrous above, the obvious but slender lateral nerves straight to margin where curved, about 15 pairs, mostly a cm. distant; panicle or cymes to 1.5 dm. long, nearly as wide, the branches divaricate; pedicels 2 mm. long; flowers greenish-white, the glabrous calyx 1 mm. high, 2.5 mm. across, the broadly ovate lobes obtuse; corolla tube 5 mm. long, 1.5 mm. thick, long-pilose within, the glabrous lobes 6 mm. long, 1 mm. wide; stamens inserted just below throat, well above middle of tube, 1 mm. long; stigma head 1 mm. broad and long, setulose, with a low collar and ellipsoid apiculi; style 0.5 mm. long; ovary glabrous, 2-celled.—The other known species (Brazilian) are *L. macrophylla* (Kuhlm.) Monachino, l.c. 68, and *L. Baehniana* Monachino, l.c.; the former has stamens attached a little above the middle, leaves almost sessile, the latter stamens about middle of tube, petioles 3–4 cm. long, inflorescence only to 4 cm. long. It honors meritoriously Charles Baehni who cooperated with Monachino's careful and persistently followed research by supplying him with flowers from cotype material at Geneva. Strangely, the latter apparently did not see the excellent photograph of the Dahlem type made by Annemarie Jaekel (Mrs. Christian Hirsch); the type was destroyed. F.M. Neg. 4386.

Loreto: Flood-free forest at the mouth of the Río Santiago, *Tessmann 4423*, type.

11. THEVETIA [Adans.] L.

Slender shrub or tree-like with lenticellate brownish bark, the branchlets grayish, spiralled alternate or verticillate leaves and showy fragrant yellow flowers in terminal irregular bracteate cymes. Intrapetiolar glands elongate. Calyx lobes multiglandular within, acute. Corolla thin with oblique obtuse lobes; stamens at apex of tube conniving with as many pubescent scales, the short anthers appendaged. Carpels 2-seeded, separated by a false partition. Fruit drupaceous, broadened laterally, very hard but with a fleshy mesocarp.

One of the most ancient plants from a horticultural viewpoint, its ornamental value having been appreciated very early.

Thevetia peruviana (Pers.) Schum. in Engl. & Prantl, Naturl. Pflanzenfam. 4, Abt. 2: 159. 1895. *Cerbera thevetia* L. Sp. Pl. ed. 2. 304. 1762.

Slender-stemmed, erect or clambering shrub sometimes 6 or 7 meters tall, with greenish-brown bark, the latex bitter; leaves alternate or verticillate, linear, long-attenuate to base, acuminate, about a dm. long or longer, scarcely ever 1 cm. wide, coriaceous, lustrous; calyx lobes 7 mm. long, 2 mm. wide; corolla-tube about 4 cm. long, to 1.5 cm. wide above, the lobes about 2.5 cm. long; fruit a bright red drupe 5 cm. thick with brown reticulate seeds.—Said to be very poisonous. Peruvian specimens mostly from shrub-tree formations; Williams noted that the latex was used for relieving toothache.

Cajamarca: Izco, near dwellings, *Stork & Horton 26326*.—San Martín: Tarapoto, *Williams 5478*. Chazuta, *Klug 4006*.—Lima: *Soukup 2901*.—Huánuco: Near Huánuco, *2445*.—Apurímac: Near Río Pacha-chaca, *Goodspeed Exped. 10532; Vargas 459*. West Indies, Mexico and widely cultivated. "Bellaquillo," "arbol de Panama."

12. LOCHNERA Rchb.

In Peru a small herb, often ligneous at base, the opposite rather crowded leaves with small clustered interpetiolar glands, the slender-tubed flowers solitary or binate. Calyx teeth eglandular, subulate. Corolla salverform, obstructed in throat by a callous annulus and long tomentosity. Stamens inserted just below the throat, the anther connective dilated, the bases conniving with stigma, this apically long-pubescent, basally with a 5-parted pubescent annulus above a conical collar. Ovary apocarpous, oblong-ovoid, the two carpels alternating with two broadly subulate disk scales. Follicles erect, cylindrical, the many black verrucose seeds in two rows.—The similar *Vinca major* L. is prostrate, flowers blue, anther connective not at all dilated.

Lochnera rosea (L.) Rchb. Conspectus 134. 1828. *Vinca rosea* L. Syst. Nat. ed. 10. 944. 1759.

Branchlets and petioles—these to 5 mm. long—finely hirsutulous-puberulent; leaves oblong-obovate, obtuse but mucronulate, mostly about 5 cm. long, 2 cm. wide, more or less puberulent; pedicels 2 mm. long; calyx 5 mm. long; corolla tube 2.5 cm. long, 1 mm. thick, puberulent, the minutely apiculate obovate lobes 1.5 cm. long, 1 cm. wide; follicles closely ribbed, about 2 cm. long, 3 mm. thick.—Cultivated and naturalized in all tropics as in Peru as shown by a number of collections besides the following. Color states are f. *alba* (Sweet) Woods. and f. *ocellata* (Sweet) Woods. Illustrated, Bot. Mag. *pl. 248;* Bailey Stand. Cycl. Hort. *fig. 3934*.

San Martín: In forest, La Roque, *Williams 7092*. Madagascar.

13. ALLAMANDA L.

Shrubby with shortly petioled verticillate leaves, intrapetiolar glands and large showy yellow or purple flowers, the long or short tube abruptly expanded into a campanulate or funnelform throat with broad rounded lobes. Calyx lobes prominent, glandless or with a single gland. Stamens at apex of the cylindric tube, alternate and conniving with as many 2-parted pubescent scales. Ovary single, 1-celled, the style slender. Fruit a soft-prickly capsule, the flat seeds alate.—Named for F. Allemand who discovered the commonly cultivated species.

Calyx lobes glandless, acute as the leaves............*A. cathartica.*
Calyx lobes with 1 gland, long-acuminate as leaves . . *A. Weberbaueri.*

Allamanda cathartica L. Mant. ed. 2. 214. 1771.

Glabrous, or more or less pubescent, sometimes including the calyx; leaves in whorls of 4, oblong-elliptic or obovate, acute, subcoriaceous to submembranous, to about a dm. long, a third to half as wide; flowers 5–7.5 cm. long or somewhat larger; calyx lobes ovate-lanceolate, acute, to 12 mm. long; corolla tube 2–3.5 cm. long, throat 3–4 cm. long; fruit about 4 cm. in diameter, the rather prickle-like processes about a cm. long.—May be partly herbaceous and clambering for two or more meters, the Mexia collection from a swamp, the flowers canary-yellow. The similar *A. Schottii* Pohl, reported, has the throat of the yellow flowers striped with dark brown.

Loreto: Iquitos, *Mexia 6493; Williams 1411; 1531; 8075.* Caballo-Cocha, *Williams 2456; Klug 1099.* Tropical America and widely cultivated. "Huitasissa" (Mexia).

Allamanda Weberbaueri Mgf. Notizbl. Bot. Gart. Berlin 9: 77. 1924.

In general similar to *A. cathartica;* petioles 1.5 cm. long, sparsely pilose, basal glands 1–4; leaves oblong-lanceolate, 1–1.5 dm. long, 1.5–2.5 cm. wide, long-acuminate at both ends, the many veins finely reticulate; flowers crowded on pedicels to 1 cm. long; sepals glabrous, 1.5 cm. long, 5 mm. wide, long-acuminate, with a single broad gland within; corolla yellow, to throat of upper tube 7 cm., the upper tube 3 cm. long, the lobes to 3.5 cm. long, the lower tube 2 cm. long, 2 mm. across; fruit unknown.—Type a 5-meter shrub. In spite of the apparent validity the species may be a variant of *A. cathartica* L.

Amazonas: In evergreen formation, 1,600 meters, Hacienda Tactamal, *Weberbauer 7142,* type.

14. HIMATANTHUS Hoffmgg.

Reference: Woodson, Ann. Mo. Bot. Gard. 25: 192–202. 1938.

Resembles *Plumeria* but the inflorescence rather regularly thyrsiform, the alternate secondary branches relatively distant. Bracts caducous but large and showy, somewhat petalaceous or foliaceous and with many minute pectinate glands at the axils. Calyx lobes very irregular, acuminate and not glandular or the calyx not manifest. Ventral cells of the anthers not protuberant. Seeds with a broad more or less concentric papery wing.—Sometimes trees attaining 30 meters but trunk even then rarely 3 dm. near base. Not a strong segregate. In this Ducke concurs; see Ann. Acad. Bras. Cienc. 27: 381–384. 1955, in which Ducke remarks that *Himatanthus* is *Plumeria.*

Leaf venation finely and densely reticulate, notably verrucose above in drying.................................*H. articulata.*

Leaf venation rather irregular and open, more or less obscure above in drying.................................*H. sucuuba.*

Himatanthus articulata (Vahl) Woods. Ann. Mo. Bot. Gard. 25: 196. 1938. *Plumeria articulata* Vahl, Eclog. Amer. 2: 20. 1798.

Slender with pale verrucose branchlets; petioles 1 cm. long; leaves elliptic or rather obovate, rounded at base, obtusely acuminate, often about 1–1.5 dm. long, half as wide, glabrous, coriaceous, the approximate nerves obvious on both sides, about 12 pairs, arcuate and joined near the margin, the veins finely reticulate; inflorescence congested, the many divisions less than 1 cm. long; bracts to 1.5 cm. long; flowers white; stigma attenuate into the apiculi, or bifid apiculus, if so interpreted.—F.M. Neg. 22257.

Peru (probably). Brazil to the Guianas; Panama.

Himatanthus sucuuba (Spruce) Woods. Ann. Mo. Bot. Gard. 25: 198. 1938. *Plumeria sucuuba* Spruce ex Muell. Arg. in Mart. Fl. Bras. 6, pt. 1: 40. 1860. *P. floribunda* Muell. Arg. l.c. *P. tarapotensis* K. Schum. ex Mgf. Notizbl. Bot. Gart. Berlin 11: 339. 1932, fide Woodson.

Resembles *H. articulata* in habit but the bark pinkish or dark brown, at least that of the branchlets; petioles 2–3 cm. long; leaves elliptic, obovate or oblong, abruptly narrowed or acute at base, acuminate or obtuse, coriaceous, the 8–15 pairs of nerves prominent at least beneath, the vein reticulation open; inflorescence little branched; bracts to 1.5 cm. long; longest calyx tooth 2 mm.; corolla white, the lobes at least as long as the tube; anthers pubescent dorsally; stigma constricted below the truncate apex, the apiculi slender; fruit ligneous with a prominent ridge, 2.5 dm. long, 4 cm. thick, dehiscing ventrally, the elliptic pitted alate seeds on a ligneous scrobiculate placenta. According to Markgraf the leaves on fruiting twigs are smaller, oblong and densely nerved. Sometimes 30 meters tall. F.M. Negs. 4393; 21027.

Shredded root, latex or fruit prepared as a tea said to be used for fevers and rheumatism.

San Martín: Tarapoto, *Ule 6473; Williams 5605; 6559.* Rioja, *Weberbauer 4701.*—Huánuco: Tocache, *Poeppig.*—Junín: Chanchamayo Valley, *Weberbauer 1927.*—Loreto: Yurimaguas, *Williams 3895; 3988; 4021; Mexia 6071; 6079* (det. Standley); *Killip & Smith 27606; Tessmann 5512.* Lower Huallaga, *Williams 7835.* Río Paranapura, *Klug 3924.* Near Iquitos, *Klug 230.* On the Ucayali, *Tessmann 3205.* Mouth of the Santiago, *Tessmann 3903.* To Brazil and Bolivia. "Sucuuba" (Spruce); "bellaku-caspi" (Tessmann), "sanango" (Mexia).

15. **PLUMERIA** [Tourn.] L.

Reference: Woodson, Ann. Mo. Bot. Gard. 25: 202–224. 1938.

Small lactescent trees, the terete trunks usually with a hard pith becoming fistulose, the wood light, the corky bark spirally scarred by the fallen leaves. Leaves alternate, eglandular. Inflorescence terminal or pseudolateral, fastigiately thyrsiform, usually much and irregularly congested, the inconspicuous scarious bracts not glandular at base, caducous. Calyx parted nearly to base, the nearly equal obtuse or shortly acuminate lobes imbricate and always glandular at tip. Corolla showy, salverform, the tube essentially straight, the limb 5-parted, sinistrorsely convolute. Ventral cells of the 5 anthers (these free) basally protuberant. Carpels 2, strikingly subinferior, united by the 2-apiculate stigma. Follicles stout, terete, the many dry compressed seeds with an eccentric basal wing.—Founded as a tribute to Charles Plumier, the pioneer systematist of the tropical New World flora (Woodson); both Tournefort and Linnaeus correctly latinized the name (Urban, Repert. Nov. Sp. 14: 341. 1916).

Plumerias are not mentioned by either Weberbauer or Herrera, yet, as Woodson remarks, *P. rubra* is cultivated in all tropical areas for "the fragrance as well as the abundance of waxy, beautifully tinted flowers vying in popularity even with the ubiquitous Oleander (*Nerium Oleander*)." Jacquin described the aroma as being "perhaps the sweetest of any plant living," while the French name Frangipani or Frangipanier, which has become widely adopted, was from a perfume so called in France after its inventor, an Italian of the Frangipani family.

Plumeria rubra L. Sp. Fl. 1: 209. 1753; 207. *P. purpurea* R. & P., *P. incarnata* R. & P., *P. tricolor* R. & P., *P. carinata* R. & P., *P. bicolor* R. & P. and *P. lutea* R. & P. Fl. Peruv. 2: 20, 21. *pls. 137–142.* 1799, fide Woodson. *P. acutifolia* Poir. Encycl. Suppl. 2: 667. 1812, fide Woodson.

Leaves long-petiolate, broadly elliptic, obovate to oblong-lanceolate, obtuse to acuminate, 12–50 cm. long, 3.5–15 cm. wide, subcoriaceous, opaque, glabrous to densely pubescent beneath, with a prominent marginal vein, the secondary venation (as tertiary) more or less immersed above, broadly arcuate to essentially rectilinear, sometimes joining the midnerve in an obscurely decurrent manner; inflorescence glabrous to more or less pubescent, the flowers white, yellow, rose or parti-colored, strictly salverform, the orifice of the tube about as wide as the base or slightly narrower, the estivation of the lobes strikingly spiral.—Typical corolla color is rose, usually with a "yellow eye;" forma *lutea* (R. & P.) Woodson, yellow, occasionally flushed with rose without; forma *acutifolia* (Ait.) Woodson, white, usually with "yellow eye," occasionally flushed with rose without; forma *tricolor* (R. & P.) Woodson, white but outer margin of lobes rose and usually with a "yellow eye." The Peruvian specimens have originated in cultivation (Woodson), as have all the species proposed by Ruíz and Pavón, who noted they differed only in color of flowers.

Lima: Lurín, *Ruíz & Pavón* (type, *P. tricolor, P. carinata*).—Huánuco: Chicoplaya, *Ruíz & Pavón* (type, *P. purpurea*).—Junín: La Merced, *5402.*—Loreto: Mishuyacu, *Klug.* Dense forest, Río Marañon Valley, *Killip & Smith & Dennis 29226.* Dense forest, Yurimaguas, *Killip & Smith 27710.* Mexico to Panama; and widely dispersed in the tropics. "Suche," "suche blanco-rosado," "-amarillo," "-turumbaco," "-moxado," "caracucho" (all Ruíz & Pavón).

16. MACOUBEA Aublet

Reference: Monachino, Lloydia 8: 291–300. 1946.

Smooth trees with opposite isophyllous leaves, many minute glands or processes sometimes hidden in the petioles, axils, and terminal dichasial corymbose many-flowered inflorescences of fragrant white flowers. Calyx persisting, the 5 lobes strongly ciliate, minutely glandular at base within. Anthers quite sessile, appendages inserted about one-fourth from base of pubescent corolla-tube, this usually shorter than the lobes. Ovary superior, densely pubescent, appearing 2-celled, the style very short, the ring incrassate, the crested capitatum usually 5-lobed. Fruit brown or orange with a thick woody shell usually consisting of a single mericarp, the large seeds attached to the wall and conspicuously vermicular-pitted.—Trees sometimes exceed 30 meters in height, 8 dm. in diameter, the gray bark fissured, the branches becoming fistulose. The copious white latex was noted by Williams as sweet. There is a transverse blade at the petiole base sometimes concealing many glands or processes (unique? or in *Tabernaemontana?*). Genus outstanding in the development of usually one carpel into a large globose fruit (Monachino), while Ducke, in comparing it to *Ambelania*, noted the short corolla tube with pilose throat, long anthers, stout subsessile stigmas, and singular fruits. Monachino observed that the characters of the two elements recognized as species are variable and while his discerning disposition is copied here it seems probable that one specific name would reflect more accurately and certainly in floristic work more conveniently the true status, as apparently suggested by Hoehne.

Leaves broadly elliptic, ultimate reticulation evident in age; corolla tube to 5 mm. long, lobes 2–4 mm. wide, anthers to about 3.5 mm. long. . . . . *M. guianensis.*

Leaves elliptic, ultimate reticulation usually obscure in age; corolla tube to 8 mm. long, lobes 4–7 mm. wide, anthers to 5 mm. long. *M. Sprucei.*

Macoubea guianensis Aublet, Pl. Guian. 2, Suppl.: 18, *pl. 378.* 1775; 297.

Young branchlets usually mottled; petioles to about 3 cm. long; leaves typically broadly elliptic to suborbicular, rather unequal at base, obtuse, 9–25 cm. long, 6–18 cm. wide, glabrous to densely hirtellous beneath; inflorescence about 60-flowered, the pedicels 4–5 mm. long; calyx and corolla slightly pubescent, the tube of the latter 4–5 mm. long, the lobes usually 3–4 mm. long, little twisted; anthers 3–3.5 mm. long; ovary about 1.5 mm. long, the style nearly lacking. —The Peruvian tree is var. *pubiflora* Monachino, l.c., 298, calyx and corolla densely pubescent, corolla lobes about 2 mm. wide, strongly twisted; anthers 2.8 mm. long; ovary about 1 mm. long; the leaves in type are 7–10 cm. long, 5.5–7 cm. wide. Species illustrated, Pulle, Neue Beitr. Fl. Sur. 3: *pl. 3;* Ducke, Archiv. Jard. Bot. Rio Jan. 3: *pls. 17, 18;* 4: *pl. 22.*

Loreto: Mishuyacu near Iquitos, *Klug 596* (type var.). To Bahia, Brazil and the Guianas. "Huapu-caspi."

Macoubea Sprucei (Muell. Arg.) Mgf. Notizbl. Bot. Gart. Berlin 14: 179. 1938; 298. *Tabernaemontana Sprucei* Muell. Arg. in Mart. Fl. Bras. 6, pt. 1: 86, *pl. 27, fig. 1*. 1860.

Young branchlets mostly not mottled; petioles about a fifth as long as the leaf blade, this 7–17 cm. long, 3.5–8.5 cm. wide, acute, in type hirtellous beneath; inflorescence lax, to about 30-flowered; lowest bracts broadly ovate, obtuse; corolla tube pubescent to puberulent above, 7–8 mm. long, the lobes about 9 mm. long; style to 1 mm. long. —The Peruvian collection was referred, with some doubt, to var. *paucifolia* (Spruce) Monachino, 299, by the latter author, its branchlets sometimes mottled, leaves glabrous; flowers few to many, the first bracts lanceolate, acuminate and corolla tube hirtellous above.

Loreto: Timbuchi on Río Nanay, *Williams 938*. Amazonas, Brazil. "Chicle" (Williams).

17. TABERNAEMONTANA [Plumier] L.

Reference: Markgraf, Notizbl. Bot. Gart. Berlin 14: 151–184. 1938.

Shrubs or small trees, branching dichotomously from the axils of small scales above a leaf-node, the opposite leaves sometimes more or less unequal (Stenosolen), the small to medium size flowers few (1) –many in terminal or pseudoaxillary cymose (compound) inflorescences. Calyx lobes equal, obtuse, few to multiglandular within. Corolla salverform, the tube straight or twisted. Anthers sagittate, free, usually dehiscing to base, inserted at apex of tube, about medially or at or near the base, the tube often more or less widened at the point of attachment, the style relatively long or short. Stigma head cylindric, sometimes short with enlarged apiculate apical protuberance and with a fleshy or membranous divaricate or reflexed ring at base or somewhat below the base. Corolla lobes in bud obtuse or acute, the bud rarely not broader than the tube, the lobes at anthesis variously directed from arcuately ascending to abruptly reflexed. Ovary obviously apocarpous, with or without basal annulus, the divergent fleshy mericarp often with notable color contrast between the pulp and the ellipsoid ribbed more or less arillate seeds.—Named for Tabernaemontanus, famed for his Kreuterbuch, published in 1625.

Markgraf, l.c., presented detailed and thoughtful consideration of the relationship of the members of this group and concluded that they were classified best under several generic names, some of which had been treated as sections by early students. Characters he regarded as important include the position of the stamens, corolla lobes in bud and after anthesis and the nature of the stigma head, ring and disk, the last more or less developed or obsolete. These were associated with other characters common in some degree to each subgroup, as presented in a highly descriptive key. Most useful is his plate illustrating the floral characters. Apparently he has sometimes corrected the taxonomy as regards specific relationship, but there seems to be too intangible and not sufficiently precise concomitance of distinctions to make their use for generic definitions practical, at least in floristic work. The similarities of the species groups are as evident as the dissimilarities and in view of the variance developed in the latter their significance as a sound basis for generic segregation has, it seems to me, still to be shown, apart from consideration of practicality. Accordingly, here, where simplicity and thus ready usefulness in classification is the desire (if often not the achievement), his generic names are not adopted. It may be remarked that previous authors have not agreed in several instances with his conclusions, and that there are a number of discrepancies between his generic key and specific diagnosis, perhaps by oversight; apparently he purported to include all species but a number were not even mentioned. After the above was written Ducke wrote that splitting of *Tabernaemontana* is unwarranted.

Stamens at or near enlarged tube-base; calyx teeth, except *T. concinna, T. arcuata,* acute; ovary disks none or obsolete; leaves more or less unequal in each pair.
  Calyx teeth broad, rounded-obtuse, often multiglandular; stigma ring present.
    Leaves membranous, oblong-elliptic, the nerves about 1 cm. distant; corolla lobes pubescent.
      Corolla lobes densely pubescent above, at least on part, 8–10 mm. long........................*T. concinna.*
      Corolla lobes thinly pubescent medially, 5 mm. long. *T. arcuata.*
    Leaves coriaceous, oblong-obovate, the nerves 5–7 mm. distant; corolla lobes glabrous..................*T. Vanheurckii.*
  Calyx teeth acute or subacute, few-glandular within.
    Corolla bud (obtuse) and lobes broader than tube; stigma ring none..............................*T. Benthamiana.*

Corolla bud (acuminate) and lobes little wider than tube; stigma ring present.

Leaves strongly disparate; calyx lobes 1.5–2 mm. long. *T. heterophylla.*

Leaves weakly disparate; calyx lobes 3–4 mm. long. *T. stenoloba.*

Stamens medial to subapical, the tube there slightly broader; calyx lobes obtuse or subobtuse, leaves equal or subequal in each pair.

Flowers inconspicuous, the lobes usually much shorter than the tube; stigma apiculi short.

Lateral nerves well united by a submarginal nerve, approximate. *T. undulata.*

Lateral nerves obscurely or not united, usually at least some about 1 cm. distant.

Leaves mostly about twice as long as wide.

Leaf acumen short; flowers often many.

Calyx glabrous, 1 cm. long; leaves to 5 dm. long, pale green.................................*T. maxima.*

Calyx glabrous, short; leaves to about 2 dm. long.

Ovary disk entire, free; cymes glabrous...*T. coriacea.*

Ovary disk uneven or lobulate, obscured in ovary; cymes subasperous..............*T. Tessmannii.*

Calyx puberulent, short; leaves to 4 dm. long. *T. Markgrafiana.*

Leaf acumen well defined, 1–2 cm. long; flowers 1–5. *T. olivacea.*

Leaves mostly about three times longer than wide.

Calyx lobes finally about 7 mm. long or longer; leaves whitish or yellowish beneath.

Calyx shorter than 1.5 cm.; disk smooth.

Calyx puberulent; leaf nerves about 15...*T. albescens.*

Calyx glabrous; leaf nerves about 20......*T. maxima.*

Calyx 1.5–2 cm. long, glabrous; disk grooved. *T. Muelleriana.*

Calyx lobes to about 5 mm. long; leaves subconcolor.

Leaves yellowish, drying pale or brownish; calyx lobes suboval, equal; disk smooth.

Leaves small, to 2.5 (3) cm. wide; disk adnate or obscure (annulus).

Stamens exserted .... *T. occidentalis.*

Stamens included .... *T. flavicans.*

Leaves often much wider, often large; disk well-defined. *T. Markgrafiana, T. sananho.*

Leaves green, usually drying dark; calyx lobes ovate-oblong, not quite equal; disk ill-defined, lobulate or ribbed (after Markgraf, may be fewer species).

Corolla tube 14–16 mm. long; leaves mostly longer than 1.5 dm.

Leaves oblong-elliptic; cymes hirtellous. . *T. hirtula.*

Leaves ovate-elliptic; cymes glabrous or nearly. *T. Tessmannii, T. tetrastachya.*

Corolla tube 1 cm. long.

Leaves ample; bracts obtuse; cyme 5–6 cm. long. *T. Killipii.*

Leaves about 1.5 dm. long; bracts acute; cyme 1 cm. long .... *T. juruana.*

Flowers showy, the broad lobes about as long as the tube; stigma apiculi slender .... *T. coronaria.*

Tabernaemontana albescens Rusby, Descr. S. Am. Pl. 83. 1920; 164. *Anacampta albescens* (Rusby) Mgf. in Pulle, Fl. Surinam 4, pt. 1: 452. 1937.

Glabrous except the puberulent calyces and corolla lobes above, the branchlets obtusely angled; leaves nearly oblong, obliquely narrowed into the short (5 mm. long) petiole, long-acuminate, 2–4 dm. long, 6–11 cm. wide, papyraceous, light green above, yellowish or pale with a velvety appearance below where the 15 or 20 pairs of secondary nerves are prominent and indistinctly joined; peduncles 5 mm. long; flowers few, yellow, the medially connate calyx glabrous within, the oblong lobes to 7 mm. long, 4 mm. wide; corolla tube 2–3.5 cm. long, 2 mm. broad, the obliquely oblong lobes to one-half as long; filaments hispidulous; stigma head 5-angulate as the slightly distant ring; ovary and smooth disk each 1 mm. high.

Loreto: According to Markgraf, 164. Bolivia to eastern Colombia and Guiana.

Tabernaemontana arcuata R. & P. Fl. Peruv. 2: 22, *pl. 143.* 1799; 174. *Peschiera arcuata* (R. & P.) Mgf. Notizbl. Bot. Gart.

Berlin 14: 171. 1938. *Merizadenia arcuata* (R. & P.) Miers, Apocyn. S. Am. 79. 1878.

Short, or medium size tree to 8 meters tall, glabrous except the corollas lightly puberulent within including the lobes; petioles 4–8 mm. long; leaves oblong- or ovate-elliptic or obovate, unequilateral at the acute base, shortly to caudately and subobtusely acuminate, more or less unequal, mostly about 12–15 cm. long, 4–6 cm. wide, but often distinctly smaller and larger, membranous, paler but scarcely yellowish beneath unless the 10–12 pairs of lateral nerves, these arcuate, obviously uniting near margins; cymes to 6 cm. long, peduncles to 0.5–2 cm. long; bracts oval, obtuse as calyx lobes, these multiglandular within; corollas white or yellowish, including the oblique-obovate lobes about 2 cm. long, the tube slightly widened upwards to about 1.5 cm. long, puberulent within; stamens subbasal, the anther-points divaricate; ring and disk obovate or the former merged with stigma head; fruit warty, scarcely 3 cm. long, half as thick.—All the collections highly variable in leaf-shape; referred by Markgraf, except as indicated, to *T. Benthamiana* but the calyx lobes broad, rounded-obtuse; the validity of the development of a stigma ring has not been investigated. Williams, Field Mus. Bot. 15: 427. 1936, gave a good description as *T. Benthamiana.* Illustrated, Markgraf, (pt.) 160, *fig. 7a.* F.M. Negs. 4435; 26884.

A tall tree that abounds in resin, white when it first exudes but turns red; when the trees are cut the resin stains the ground (Ruíz & Pavón); fruit at base vivid orange, the black coarsely lineate seeds in a brilliant red jelly-like mass (Woytkowski).

San Martín: Juanjuí, *Klug 3805; 4215* (det. Standley, *T. Benthamiana*). Tarapoto, *Woytkowski 35159* (det. Cuatrecasas, *T. Benthamiana*); *Williams 5466; 5489; 5508; 5538; 6290.*—Huánuco: Pozuzo, *Ruíz & Pavón,* type.—Loreto: Lower Río Huallaga, *Killip & Smith 29262.* "Sinca sunanho" (Williams).

Tabernaemontana Benthamiana Muell. Arg. in Mart. Fl. Bras. 6, pt. 1: 80. 1860; 175. *Peschiera Benthamiana* (Muell. Arg.) Mgf. Notizbl. Bot. Gart. Berlin 14: 171. 1938.

Glabrous unless the lightly pubescent flowers, these often many in corymbiform basally branched cymes; petioles to about 8 mm. long; leaves ovate or elliptic, acute at base, shortly to caudately acuminate, usually 1–1.5 dm. long, 5–6 (8) cm. wide, submembranous, densely veiny, the 15–20 lateral nerves arcuately united marginally; cymes 5–6 cm. long, the peduncle very short (about 5 mm.), the primary branches elongate; bracts broadly ovate-spatulate, obtuse; pedicels equaling or longer than calyces, these with ovate subacute obscurely ciliolate lobes, 5-glandular within at base; flowers, including the erect lobes, 2 cm. long, the slender tube 12 mm. long, glabrous without, pubescent within, enlarged below the middle to the stamen insertion; corolla lobes nearly glabrous, obliquely obovate, about half as long as tube, the bud oblong-ovoid; ovary and style subequal, disk obsolete; fruit about 3 cm. long, warty.—Markgraf, 175, described the leaves as acuminate at base, flowers white, as many as 15, buds more than half as long as tube, stigma head pointed, fruits 3 cm. long, warty. The Amazonian related species include *T. myriantha* Britton ex Rusby, Descr. S. Am. Pl. 84. 1920, and *T. stenantha* Mgf. l.c. 10: 1037. 1930, both with basally rounded leaves, more flowers, the leaves (beneath) and the salmon-colored flowers of the former pubescent, those of the latter glabrous. Illustrated, Markgraf, 160, *fig. 7b.* F.M. Neg. 4436.

Loreto: Caballo-cocha, *Williams 2217; 2322; 2325.* Amazonian Brazil. "Sinca sananho."

Tabernaemontana concinna (Miers) Macbr., comb. nov. *Peschiera concinna* Miers, Apocyn. S. Am. 44. 1878; 174.

Branchlets angulate-sulcate, leafless below, annulate; petioles 6–10 mm. long; leaves elliptic, acute at base, tapering apically into a curved, rather broad acumen, the larger of each lower pair in type about 12 cm. long, 5 cm. wide, the smaller about half as large, the upper pairs somewhat reduced, all chartaceous, opaque and green above, paler and yellowish beneath, the slender nerves rather prominent; panicles to 16-flowered, 2–4-fasciculate, branched from base, the branches about 3-flowered, 2.5 cm. long or longer; pedicels 6–10 mm. long, medially bracteolate; sepals 0.07 mm. long, ovate, with only 1 multilaciniate gland within (Miers); corolla tube glabrous, 14 mm. long, segments 8 mm. long, dolabriform, densely pubescent within on the lower half; stamens inserted near base; disk none.—After Miers, but Markgraf distinguished it from *T. arcuata* on the basis of smaller firmer leaves and thicker corolla lobes densely pubescent all over the upper surface; the apparent differences may prove to be intangible; Miers' interpretation of the calyx gland may be an error and he describes the sepals as acute. F.M. Neg. 4439.

San Martín: Tarapoto, *Spruce 4534*, type. Juanjuí, *Klug 3854* (det. Standley, *T. arcuata*).—Loreto: Fortaleza, *Williams 4273* (det. Markgraf, *T. arcuata*).

Tabernaemontana coriacea Link ex Roem. & Schult. Syst. Veg. 4: 431. 1819; 162. *T. rubro-striolata* Mart. ex Muell. Arg. Fl. Bras. 6, pt. 1: 71, *pl. 21, fig. 1.* 1860. *Anacampta coriacea* (Link) Mgf. Notizbl. Bot. Gart. Berlin 14: 162. 1938.

Glabrous brownish-barked shrub; petioles 6 mm. long; leaves broadly ovate, shortly acute at rounded base, shortly and acutely acuminate, 12–20 cm. long, 7–10 cm. wide, subcoriaceous, veins puncticulate-scabrous above, secondary nerves about 12, not joined; peduncle 2.5 cm. long, flowers about 12, pedicels at least as long as calyx, this white as the red-lined corolla, this 2.5 cm. long; calyx lobes rotund-obtuse, 5-glandular within; corolla tube nearly 4 times as long as calyx, three and one-half times longer than pulveraceous lobes; stamens at middle of tube, anthers pubescent; bud of lobes ovoid; disk entire, follicles narrowly oblong-ovoid, acuminate, pulveraceous asperulous.—Illustrated, (fl.), Markgraf, 160, *fig. 1.* F.M. Neg. 26886.

Loreto: Manfinja, upper Río Nanay, *Williams 1103* (det. Standley, *Macoubea paucifolia*). La Victoria, *Williams 2739* (det. Markgraf). Amazonian Brazil.

Tabernaemontana coronaria (Jacq.) Willd. Enum. Hort. Berol. 275. 1809. *Ervatamia coronaria* (Jacq.) Stapf in Fl. Trop. Africa 4, pt. 1: 127. 1902. *Nerium coronarium* Jacq. Icones Pl. 1: *pl. 52.* 1781. *N. divaricata* L. Sp. Pl. 209. 1753, not *T. divaricata* (Lour.) G. Don.

Branchlets slightly angled, verruculose; petioles 1 cm. long; leaves oblong-elliptic or -lanceolate, acutely acuminate, 7–10 cm. long, 2–3 cm. wide, the remote strongly arcuate lateral nerves about 5 pairs; calyx teeth 2 mm. long; corolla tube 1–2 cm. long below, 1–2 mm. wide, expanded above, the oblong-ovate obtuse lobes as long; follicles 2–3 cm. long, to 1 cm. thick with a recurved beak.—Widely cultivated, the following specimens apparently from naturalized plants. Standley called the Williams collections *T. divaricata* (L.) R. Br.

San Martín: Tarapoto, *Williams 5944.*—Loreto: In clearing, Mishuyacu, near Iquitos, *Klug 299* (det. Markgraf). La Victoria, *Williams 2518.* Cajacumba, *Williams 2007.* Yurimaguas, *Williams 4505.* India. "Papelillo."

Tabernaemontana flavicans Roem. & Schult. Syst. Veg. 4: 797. 1819; 165. *Anartia flavicans* (R. & S.) Miers, Apocyn. S. Am. 82.

1878. *Bonafousia latiflora* Miers, l.c. 50, fide Mgf. *Taberna disparifolia* Miers, l.c. 63, fide Markgraf.

Low glabrous shrub with slender terete or early compressed branches and oblong- or lanceolate-elliptic, long-acuminate leaves, mostly 5–7 cm. long, scarcely 2 (2.8) cm. wide, firm-membranous; petioles about 7 mm. long; cymes terminal, reduced to 3–5 flowers, the peduncle short; pedicels stout, subequaling the calyx, this with ovate subobtuse segments 5–6-glandular within, 2 or 3 mm. long; corolla tube cylindric, pubescent only within near base and below the stamens, these nearly at the throat, 3–3.5 cm. long including the obliquely oblong lobes which before anthesis form an oblong-ovoid bud; stigma ring below the head, entire; ovary disk developed; follicles reported as echinate.—Compare *T. olivacea*. Illustrated, Mart. Fl. Bras. 6, pt. 1, *pl. 25, fig. 1;* Markgraf, (fl.), 160, *fig. 2.*

San Martín: Tarapoto, (*Spruce 4611*, type, *T. disparifolia*). Northern Brazil.

Tabernaemontana heterophylla Vahl, Eclog. Amer. 2: 22. 1798; Icones *pl. 14.* 1799; 178. *Peschiera tenuiflora* Poepp. in Poepp. & Endl. Nov. Gen. & Sp. 3: 70, *pl. 280.* 1845. *T. tenuiflora* (Poepp.) Muell. Arg. in Mart. Fl. Bras. 6, pt. 1: 76. 1860. *P. heterophylla* (Vahl) Miers, Apocyn. S. Am. 38. 1878. *Stenosolen heterophyllus* (Vahl) Mgf. in Pulle, Fl. Surinam 4, pt. 1: 455. 1937. *P. puberiflora* Miers, l.c. 43?

Small (about 2 meters) tree, glabrous except the branchlet tips and the corollas within; leaves subsessile, obliquely elliptic, rounded on one edge, narrowed on the other, abruptly acuminate, the opposite two more or less unequal, 7–15 cm. long, 2.5–5 cm. wide, papyraceous, the 10–12 pairs of secondary nerves strongly arcuate; inflorescences few-flowered, 2–3 cm. long, the peduncles, pedicels and flowers very slender; calyx teeth ovate-lanceolate, 1.5–2 mm. long, somewhat spreading; corolla white, the straight tube slightly widened at base, 1 mm. broad, 1 cm. long, long-pubescent within; corolla tip in bud 4 mm. long, lobes 6 mm. long, anthers inserted toward base, dehiscing only medially, disk lacking; fruits (mericarp) crescent to subobovoid, 3.5 cm. long, 1 cm. thick, orange-colored, with many short processes, the brown seeds with a ring-like aril around the hilum.—Illustrated, Markgraf, (fl.), 160, *fig. 6.*

San Martín: Tarapoto, (*Spruce 4245?*, type, *P. puberiflora*).—Loreto: Mishuyacu, near Iquitos, *Klug 433* (det. Markgraf). Río Mazán, *José Schunke 379.*

Tabernaemontana hirtula Mart. ex Muell. Arg. in Mart. Fl. Bras. 6, pt. 1: 73, *pl. 24.* 1860; 168. *Bonafousia hirtula* (Mart.) Mgf. Notizbl. Bot. Gart. Berlin 14: 166. 1938. *Anacampta hirtula* (Mart.) Miers, Apocyn. S. Am. 67. 1878.

Branches and cymes early densely to obscurely hirtellous with fulvous articulate trichomes; branchlets compressed; petioles 7–9 mm. long; leaves oblong-elliptic, acute or attenuate at base, acutely short-acuminate, to about 1.5 dm. long, a third or less than half as wide, firm-membranous, glabrous with 15–18 rather prominent nerves; cyme lateral, dichotomous, to about 15-flowered, the peduncle to 2.5 cm. long, pedicels at least equaling the calyx, this about 4 mm. long with puberulent ovate obtuse segments, 4–5-glandular within; corolla to 2.5 cm. long, puberulent only within medially at the base of the anthers, the lobes forming an ovoid bud; stigma ring entire, pendent at base of head; ovary disk obsolete.—The var. *maynensis* Huber, Bol. Mus. Goeldi 4: 600. 1906, seems, from a photo and scrap, to be referable to *T. Tessmannii*, the trichomes few and rather obscure. The original description reads: leaves broader and shorter than in the type. F.M. Neg. 20139.

Loreto: Laguna de Conchahuaya, *Huber 1394* (type, var.). Northern Brazil.

Tabernaemontana juruana Schum., in herb. *Bonafousia juruana* [Schum.] Mgf. Notizbl. Bot. Gart. Berlin 14: 181. 1938; 168.

Glabrous (except ciliate calyx lobes) shrub 1–2 meters high, the branchlets subterete; leaves shortly petioled, lanceolate, acute both ends, to 2.5 dm. long, 7 cm. wide, but mostly much smaller, coriaceous, lightly undulate, the secondary nerves to 16 pairs, the veins obscure; dichasial inflorescences terminal or pseudoaxillary, about 1 cm. long, in type many-flowered; bracts caducous, acute; calyx lobes oblong, obtuse, unequal, 5–6 mm. long, 2 mm. wide, multiglandular within; corolla white, the twisted tube 1 cm. long, 1.5 mm. broad, the dolabriform undulate lobes 5–6 mm. long; anthers affixed in upper third of tube; cylindric stigma head sulcate, apiculi obtuse, minute, annulus membranous, deflexed; disk enclosing half of the ovary; fruits (mericarp) horizontal, shortly acuminate, 2–2.5 cm. long, 1 cm. broad and high, the oblong seeds 5 mm. long.—Easily distinguished from the related *T. tetrastachya* (HBK.) Mgf. (*T. longifolia* Benth. fide Markgraf) of more northern range by the small flowers (Markgraf). F.M. Neg. 26887.

Loreto: Caballo-cocha, *Williams 2229*. Upper Itaya, *Williams 3299*. La Victoria, *2539*.—Río Acre: Seringal San Francisco, *Ule 9699*. Northern Amazonian Brazil to Bolivia.

Tabernaemontana Killipii Woods. Ann. Mo. Bot. Gard. 18: 541. 1931; 168. *Bonafousia Killipii* (Woods.) Mgf. Notizbl. Bot. Gart. Berlin 14: 167. 1938.

Type a tree 4–5 meters tall, the dichotomously divided terete branchlets and 5–6 cm. long peduncles early minutely scabrous-hirtellous becoming glabrate; petioles about 1 cm. long, joined at base by transverse line; leaves broadly ovate-elliptic, obtuse at base, shortly and obtusely acuminate, 2.5–3 dm. long, about 1.5 dm. wide, subcoriaceous, glabrous; cymes lateral, the branches 20–30-flowered, the ovate-reniform marginally ciliolate bracts about 1 mm. long; pedicels 0.75–1 cm. long, glabrous as the ovate-oblong subobtuse somewhat unequal calyx lobes, these 3–4 mm. long; corolla lobes 3–4 mm. long, obliquely oblong, the cylindric tube 0.75–1 cm. long; anthers linear, completely inserted; ovary glabrous, nectary none or scarcely evident; follicles smooth, oblong-ellipsoid, little divergent, acuminate at both ends.—Referred by Markgraf to *T. hirtula* Mart. with much smaller, differently shaped leaves, longer petioles, shorter peduncles, hirtellous calyx lobes (author).

Loreto: Iquitos, *Killip & Smith 27414*, type.

Tabernaemontana Markgrafiana Macbr., nom. nov. *Bonafousia longituba* Mgf. Notizbl. Bot. Gart. Berlin 14: 180. 1938; 167, not *T. longituba* Pichón, 1948.

Small tree with angled branchlets, glabrous except for the terminal or pseudoaxillary cymes, these to 12-flowered; petioles stout, 1 cm. long; leaves subcoriaceous, broadly elliptic, shortly acute at base, shortly acuminate, to 4 dm. long, 1.5 dm. wide, lactescent, smooth beneath, the oblique straight secondary nerves 16–18 pairs, the veins obscure; peduncles stout, 1–1.5 cm. long (pedicels slender, 2–3 mm. long), shortly pubescent as the erect calyx and corolla lobes without, the former 4 mm. long, the orbicular lobes multiglandular within, the latter obliquely oblong, 8 mm. long, 3 mm. wide, spreading, in bud semiglobose, scarcely broader than twisted tube, this yellowish, 2 cm. long, to 3 mm. broad; stigma "head" broadly cylindric, sulcate, with a basal pendent membranous annulus, the obtuse apiculi minute; style long, disk a third as long as ovary; fruits (mericarp) ellipsoid or subglobose, apiculate, 3 cm.

long, 2 cm. wide, 1.5 cm. thick, the many arillate seeds 1 cm. long.—May prove to be a race of *T. sananho* with reflexed corolla lobes, subacute buds broader than tube, this at most twice as long; the subglobose buds and the merely spreading lobes suggest the invalidity of these characters as supporting generic lines. Attains 2–4 meters; flood-free woods.

Loreto: Mouth of the Santiago, *Tessmann 4119; 3998; 4239; 4260.* Puerto Melendez, *Tessmann 3909.* On the middle Río Blanco, *Tessmann 3013.* Amazonian Brazil. "Utschu sanango" (Tessmann).

Tabernaemontana maxima Mgf. Notizbl. Bot. Gart. Berlin 10: 1036. 1930; 164.

Small glabrous tree with stout alate-compressed branchlets; petioles scarcely 1 cm. long; leaves elliptic, cordate at base, acuminate, to over 5 dm. long, 2 dm. wide, coriaceous, lucid above, smooth beneath, nerves to 20, little prominent above, grooved beneath; corymbs few-flowered, peduncle stout, short; bracts small, ovate; pedicels 5 mm. long; calyx campanulate, 1 cm. long, the cordate-elliptic obtuse lobes 6–7 mm., inner glands many; corolla white, the tube 2.5 cm. long, 3 mm. thick, pilose within below the stamens, the lobes in bud globose, apiculate, 5 mm. wide, twice as long, lanceolate; anthers inserted above the middle, acute, 6 mm. long; stigma obtuse, ringed; ovary glabrous, ovoid-acuminate in an elevated disk.—Near *T. macrocalyx* Muell. Arg. (author), who later, 164, placed it near *T. coriacea* Link with shorter leaves, calyx and flowers.

Loreto: Yurimaguas, *Killip & Smith 27701* (det. Woodson); *Williams 4186* (det. Markgraf, *T. Poeppigii,* i.e. *T. sananho*). Amazonian Brazil.

Tabernaemontana Muelleriana Mart. Fl. Bras. 6, pt. 1: 181. 1860; 163. *T. Benthamiana* Muell. Arg. l.c. 70, not Muell. Arg. l.c. 80.

Glabrous, even the calyces, these in types 2.6 cm. long; branchlets trigonous; petioles to 1 cm. long, verrucose punctate beneath; leaves oblong-ovate, subacute at base, acutely acuminate, those of the branchlets to 3.5 dm. long, 12 cm. wide, submembranous, venose, the 20 or more prominent lateral nerves not at all united marginally, about 1 cm. distant; cymes axillary, compact, 5–8-flowered; peduncle rigid, 2 cm. long, bracts ovate-lanceolate, obtuse, 2–3 striately glandular at base within; pedicels shorter than calyx, this tubular-campanulate, the oblong-ovate obtuse segments glandular within toward base; corolla tube cylindric, 4 mm. long, stamens affixed at one-third the length (from base), glabrous within and without, about a third longer than the subglobose bud, the lobes obliquely oblong-obovate; ovary disk short, entire.—After Mueller, the corollas in types unopened. Determinations by Markgraf. F.M. Negs. 4448; 31784.

Loreto: Mishuyacu, *Killip & Smith 29985; Klug 191.* Pebas, *Williams 1592; 1838.* Upper Amazon, Brazil.

Tabernaemontana occidentalis Miers, Apocyn. S. Am. 58. 1878.

Branchlets pale, striate; petioles 2 mm. long; leaves lanceolate-oblong; acute at base, gradually acuminate, the tip itself subobtuse, about 1 dm. long, 2.5 cm. wide, firm-membranous, green above, paler beneath, the slender spreading nerves little prominent, subimmersed above; panicles lateral, the peduncle to 2 cm. long with 2 divaricate 2-flowered branches 6 mm. long, bracted as the slender pedicels, these 8 mm. long; sepals imbricate, ovate, obtuse, submembranous, 4 mm. long; corolla tube cylindric, 6 mm. long, the membranous obliquely oblong lobes as long and as wide; anthers bluish, 3 mm. long, nearly entirely exserted.—After Miers; apparently, ex char., similar to *T. amygdalaefolia* Jacq., widely distributed north of Peru, typically with many flowers, less exserted stamens, and quite possibly a phase of that species.

Peru: Without locality, (*Maclean*, type, British Museum).

Tabernaemontana olivacea Muell. Arg. in Mart. Fl. Bras. 6, pt. 1: 75. 1860; 165. *Bonafousia olivacea* (Muell. Arg.) Miers, Apocyn. S. Am. 52. 1878. *Anartia olivacea* (Muell. Arg.) Mgf. Notizbl. Bot. Gart. Berlin 14: 165. 1938.

Completely glabrous, even the corolla within, branchlets compressed, olivaceous as leaves, the branches terete, verruculose; petioles 5–8 mm. long, leaves broadly elliptic-ovate, rounded to the obtuse or subacute base, abruptly and obtusely subcaudate acuminate, in Peru mostly about 1 dm. long, half as wide, according to Mueller, at maturity 1.5–3 dm. long, 6–11 cm. wide, veins fine, most obvious above, the 6–8 nerves evanescent marginally; cymes lateral, compact, 2–5-flowered; peduncles very short; bracts broadly ovate; calyx segments rounded-obtuse, 7–10-glandular within; flowers 3.5 cm. long, tube 5 mm. in diameter, throat subplicate; lobes to 2.5 cm. long; stamens at somewhat lower than two-thirds the length of the tube; disk coherent to acute ovary; follicles to 4 cm. long, nearly half as thick, smooth.—Leaves and calyces somewhat shorter in the Peruvian collections; determinations mostly by Markgraf. It seems possible that the Peruvian material may be referable to *T. disparifolia* Miers, reduced here to *T. flavicans*, following Markgraf. Williams, Field Mus. Bot. 15: 427. 1936, gave a description of the wood of his *4194*. F.M. Neg. 4449.

San Martín: Pongo de Cainarachi, *Klug 2709*.—Huánuco: Tingo María, 700 meters, *Stork & Horton 9474* (det. Standley, *T. arcuata*).—Loreto: Yurimaguas, *Poeppig 2238; Killip & Smith 27559; 29053; Williams 3887; 4194*. Balsapuerto, *Klug 2856*. To Surinam.

Tabernaemontana sananho R. & P. Fl. Peruv. 2: 22, *pl. 144*. 1799; 167. *Merizadenia sananho* (R. & P.) Miers, Apocyn. S. Am. 78. 1878. *T. Poeppigii* Muell. Arg. Linnaea 30: 405. 1860, fide Mgf. *Taberna Poeppigii* (Muell. Arg.) Miers, l.c. 63. *Bonafousia sananho* (R. & P.) Mgf. Notizbl. Bot. Gart. Berlin 14: 166. 1938.

Glabrous, the internodes elongate, subequaling the ovate or ovate-elliptic (rarely ovate-lanceolate) leaves, these acute or subobtuse at base, acuminate, often 2–2.5 dm. long, about 1 cm. wide (petioles 7–10 mm. long), sometimes 1.5 dm. long, 2.5–4 cm. wide, drying membranous, with 14–16 pairs of lateral nerves not at all united marginally; cymes lateral, rather few-flowered, the peduncle more or less developed (to about 4 cm.), the pedicels sometimes equaling the calyx; bracts and nearly free calyx segments broadly ovate, rounded-obtuse, ciliolate, with 5–7 glands at base within; corolla tube slender, 12–15 mm. long or longer, bud ovoid, lobes at least half as long as disk, dolabriform, reflexed; stamens medially affixed, hispidulous at base of anthers; disk entire, ovary ovoid.—Flowers apparently to finally 3 cm. long with lobes, the tube and lobes subequal; leaves noted by Woytkowski as coriaceous. Williams, Field Mus. Bot. 15: 428. 1936, described the wood. Tree, often 5 to 8 meters tall; follicles smooth, to 6 cm. long, 5 cm. in diameter, the many somewhat compressed brownish seeds striate dorsally. Williams collections with smooth fruits determined by Markgraf before segregation of his *T. longituba*. F.M. Negs. 7530; 31785 (*T. Poeppigii*).

San Martín: Pongo de Cainarachi, *Klug 2740* (det. Standley).—Huánuco: Monzón Valley, *Weberbauer, 285*. Cuchero, *Poeppig*. Tocache, *Poeppig 1923* (type, *T. Poeppigii*); Tingo María, *Stork & Horton 9474* (det. Standley, *T. arcuata*).—Junín: Río Paucartambo Valley, *Killip & Smith 25300* (det. Markgraf).—Loreto: Caballo-cocha, *Williams 2109; 2229; 2468.* Alto Río Itaya, *Williams 3299.* Yurimaguas, *Williams 4656; 4594; Killip & Smith 27655.* Manfinja, *Williams 1103* (det. Standley, *Macoubea parvifolia*). Iquitos, *Williams 8062a.* Aguaitia, *Woytkowski 431* (det. Cuatrecasas). To Brazil and Colombia. "Sananho," "jaen sananho," "sanangillo," "yacu sanango," (Williams); "lagarto micunan," "uchu sananho."

Tabernaemontana stenoloba Muell. Arg. Linnaea 30: 407. 1860; 178. *Peschiera stenoloba* (Muell. Arg.) Miers, Apocyn. S. Am. 38. 1878. *Stenosolen stenolobus* (Muell. Arg.) Mgf. Notizbl. Bot. Gart. Berlin 14: 177. 1938. *P. lingulata* Miers, l.c. 42?

Similar to *T. heterophylla* but the opposite leaves not notably unequal, calyx tube sublinear, 3–4 mm. long; tip of corolla bud 8 mm. long and the tube 2 mm. thick; branchlets slender even the upper terete; internodes half as long as the leaves, these in type ovate, elliptic or obovate, abruptly attenuate at base, shortly, narrowly and acutely apiculate, 1–1.5 dm. long, 5 cm. wide (petioles 6–8 mm. long), membranous, the 8–10 lateral nerves not joined; cymes 6–8-flowered, glabrous; peduncles 3.5–4 cm. long, the corymbiform inflorescence with broadly ovate acuminate bracts 2–2.5 mm. long; pedicels and calyces subequal, the latter 5 mm. long, deeply 5-parted, the segments linear-lanceolate, 4–6-glandular within; corolla with lobes 2.25 cm. long, glabrous except within at base near the stamens, the bud of the linear-lanceolate lobes oblong-ovoid, acute; follicles obovoid, warty-echinate.—As here interpreted, leaves rather unequal, sometimes as in *T. heterophylla* with shorter calyx lobes; species seem to be weakly defined, if definable. *Mathews 1542* without data (not seen) is the type of *P. lingulata* Miers. F.M. Neg. 34361.

Huánuco: Near Cuchero, *Poeppig*, type (first cited spec.).—Loreto: Yurimaguas, *Poeppig 2019* or *2079* (cited as part of type); *Williams 3920; 4199; 4451.* Iquitos, *Williams 8104; Klug 412; 1236.* Ecuador?

Tabernaemontana Tessmannii (Mgf.) Macbr., comb. nov. *Bonafousia Tessmannii* Mgf. Notizbl. Bot. Gart. Berlin 14: 182. 1938; 168.

Essentially glabrous shrub attaining 2 meters, the branchlets terete; petioles 2 cm. long, with a stipuliform callus; leaves elliptic, acute at base, shortly acuminate, to 22 cm. long, half as wide, coriaceous, with 15 pairs of scarcely arcuate secondary nerves; inflorescences many-flowered, the 4–5 cm. long peduncle with a few asperous trichomes; bracts ovate-oblong, obtuse, 4–5 mm. long; pedicels to 1 cm. long; calyx lobes oblong, obtuse, unequal, ciliate, few-glandular within; corolla tube twisted, whitish, 2 cm. long, 3 mm. broad, the refracted lobes one-third shorter, 6 mm. broad, slightly verruculose above; anthers inserted in the upper third of the tube, this densely barbate below them; stigma head subglobose (apiculi obsolete), sulcate, the basal annulus deflexed; ovary 4 mm. high, half enclosed in the incised disk.—There are a few single trichomes in the upper axils of the inflorescence in contrast to the abundant pubescence and asperity of the related *B. hirtella* (author); seems rather comparable to *T. tetrastachya* if separable by its large leaves and obscurely verruculose corolla lobes. Type from river shore, in the water.

San Martín: Tarapoto, *Williams 6704* (fruit smooth, subglobose). —Loreto: Middle Río Blanco, *Tessmann 3022*, type. Río Paranapura, *Klug 3942* (det. Standley, *T. Poeppigii*). "Yacu sanango" (Tessmann); "uchusanango" (Williams).

Tabernaemontana tetrastachya HBK. Nov. Gen. & Sp. 3: 227. 1819; 168. *Bonafousia tetrastachya* (HBK.) Mgf. in Pulle, Fl. Surinam 4, pt. 1: 454. 1937. *T. longifolia* Benth. in Hook. Journ. Bot. 3: 243. 1841, fide Markgraf. *Malouetia tetrastachya* (HBK.) Miers, Apocyn. S. Am. 92. 1878.

Characters in general that of *T. Tessmannii* but the leaves mostly three times longer than wide, more ovate-elliptic, usually about 1.5 dm. long, and the flowers quite smooth.—In type the leaves are mostly 2 dm. long; Markgraf restricted the range to north and east of Peru, but it probably should include *T. Tessmannii.* Illustrated, Markgraf, (fl.), 160, *fig. 4.* F.M. Neg. 38729.

Loreto: Río Mazán, *José Schunke 60* (det. Woodson). To the Guianas and Colombia. "Lobosanango" (Schunke).

Tabernaemontana undulata Vahl, Eclog. Amer. 2: 20. 1798; 167. *Bonafousia undulata* (Vahl) DC. Prodr. 8: 359. 1844.

Glabrous except the flowers; branchlets soon terete; leaves elliptic-oblong, narrowed into the 5 mm. long petioles, caudate-acuminate (acumen 1–2 cm. long), about 1–1.5 (2) dm. long, 3–7 (9) cm. wide, dark green above, yellowish or pale below, undulate at margins, the

15–20 pairs of secondary nerves straight, united by a marginal vein, prominent as also the veins between; peduncles 1–1.5 cm. long; flowers few; calyx lobes rounded, more or less unequal, inner glands few, puberulent without, about 5 mm. long, 3 mm. broad; corolla yellow with red tube, this not twisted, to 2 or 2.5 cm. long, 3 mm. broad, slightly widened at base and upper third, glabrous except in throat and below anthers, lobes obliquely oblong, pubescent, revolute, the fleshy parts ascending in bud, the membranous, before expansion, subenclosing the stamens; disk 1.5 mm. high; fruits (mericarp) recurved, almost reniform, 4.5 cm. long, 3 cm. broad, 2.5 cm. thick, smooth, the ventral groove and 2 lateral ribs uniting at an apical depression; seeds 1–1.5 cm. long, obovoid, on thick fleshy red funicles. —Ordinarily a tree of northern Brazil; its occurrence in Amazonian Peru needs verification. Illustrated, Mart. Fl. Bras. 6, pt. 1: *pl. 21* (flowers and fruit); Miers, l.c. *pl. 6, fig. B.*

Loreto (fide Markgraf, 167). To Trinidad.

Tabernaemontana Vanheurckii Muell. Arg. in Van Heurck & Muell. Arg. Obs. Bot. 168. 1871. *Stenosolen Vanheurckii* (Muell. Arg.) Mgf. Notizbl. 14: 177. 1938; 178. *Peschiera blanda* Miers, Apocyn. S. Am. 44. 1878.

Nearly *T. arcuata* and probably not distinct but as to type leaves rather oblong-obovate, rather weakly unequal in each pair, chartaceous or coriaceous, the nerves approximate; calyx teeth oval, rounded-obtuse, 2–3 mm. long, soft puberulent as the corolla, this with tube 12 mm. long, 2 mm. broad, the corolla tip in bud 3 mm., lobes 7 mm. long.—*S. Eggersii* Mgf. l.c. 183, from southeastern Ecuador, has membranous, strongly unequal leaves in each pair, the nerves remote, the sublinear calyx teeth 4–5 mm., corolla tube 2 cm. long. F.M. Neg. 26895.

San Martín: Tarapoto, *Spruce 4209*, type; also type of *P. blanda.*

18. ALLOMARKGRAFIA Woods.

Reference: Woodson, Ann. Mo. Bot. Gard. 20: 625–628. 1933.

Lactescent lianas, the lower branches opposite, the greenish or yellowish infundibuliform flowers borne in alternate lateral racemose inflorescence with di- or trichotomously divided peduncle. Leaf midrib glandular at the base on the upper surface; stipular ring obvious at nodes. Calyx lobes imbricate at base with many uniformly distributed glandular squamellae at base within. Corolla tube straight, narrowly cylindric, abruptly dilated into a broad campanulate throat at the insertion of the stamens, these entirely included, the anthers consisting of 2 parallel uniformly fertile sporangia borne vertically near the apex of a sagittate obtusely 2-auricled peltate connective; filament retrorsely pilose. Stigma pentagonal-fusiform. Nectaries 5, free or somewhat concrescent. Follicles terete, acuminate, the truncate seeds apically comose.—Name honors the author's able and cooperative friend of Berlin-Dahlem, Friedrich Markgraf.

Allomarkgrafia ovalis (Mgf.) Woods. Ann. Mo. Bot. Gard. 19: 45. 1932; 626. *Echites ovalis* Mgf. Notizbl. Bot. Gart. Berlin 9: 79. 1924.

Glabrous, the stems rather stout; petioles 1–1.25 cm. long; leaves narrowly oblong-elliptic, obtuse or rounded at base, abruptly and acutely subcaudate, 1–1.5 dm. long, 3.5–5 cm. wide, coriaceous; inflorescence somewhat shorter than the subtending leaves with 15–20 greenish- or yellowish-white flowers on pedicels 2–2.5 cm. long, the solitary scarious bracts minute; calyx lobes ovate-oblong, obtuse or broadly acute, 3–4 mm. long, scarious, the many squamellae narrowly ligulate; corolla tube 1.5–2 cm. long, about 3 mm. wide at base, the throat 1.5–2.5 cm. long, about 1 cm. across at orifice, the widely spreading obliquely obovate-reniform lobes 1–1.5 cm. long; anthers glabrous, 5–6 mm. long; ovary oblong-ovoid, 3–4 mm. long, stigma 3–5 mm. long; nectaries oblong-ovoid, about 2 mm. long.—Beautifully illustrated, Woodson, l.c. 23: *pl. 1,* opposite page 426. F.M. Negs. 4495; 29215.

San Martín: In open shrub-wood, Tarapoto, *Weberbauer 4686; 7740.* Zepelacio, *Klug 3758* (det. Standley). La Laguna (without data, *Werckle 69*).—Huánuco: Chicoplaya, *Tafalla,* type.—Loreto: Manfinja, Río Nanay, *Williams 1133.* Pumayacu, *Klug 3157* (det. Standley).

19. **MESECHITES** Muell. Arg.

Reference: Woodson, Ann. Mo. Bot. Gard. 20: 629–645. 1933.

Habit of *Allomarkgrafia* and in general character similar but the inflorescence once or twice forked, the corollas salverform and, especially, the stigma fusiform-umbraculiform. Leaf-glands 1–4, often at base of midrib, more or less laminate, inconspicuous. Pedicels indefinitely congested. Calyx squamellae several, often alternate. Corolla tube slightly dilated at insertion of stamens.—The character of the inflorescence and the fusiform stigma make it a recognizable if scarcely authentic segregate of *Mandevilla*.

Somewhat puberulent, usually including the coriaceous leaves. *M. acuminata.*

Glabrous or essentially, the leaves firm-membranous. . . . . *M. trifida.*

Mesechites acuminata (R. & P.) Muell. Arg. Linnaea 30: 446. 1860; 635. *Echites acuminata* R. & P. Fl. Peruv. 2: 19, *pl. 134.* 1799. *Echites trifida* Jacq. f. *puberula* Mgf. Notizbl. Bot. Gart. Berlin 9: 80. 1924.

Stems rather stout, an early minute puberulence usually persisting at the nodes as also on either leaf surface, sometimes glabrous; petioles to 2 cm. long; leaves broadly oblong-elliptic to oblong-lanceolate, rounded or usually openly cordate at base, acuminate to acute and mucronulate, 8–12 cm. long, 3.5–7 cm. wide, coriaceous, glands mostly geminate, laminate or pectinate; inflorescence much shorter than leaves, the floriferous branches and primary peduncles subequal and with 5–12 greenish-white, red- or purplish-tinted flowers on pedicels to 1.5 cm. long, the minute ovate bracts scarious; calyx lobes broadly ovate-oblong, more or less rounded, 4–5 mm. long; corolla tube 2.25–2.5 cm. long, about 2 mm. across at base, somewhat dilated at insertion of stamens, the sharply reflexed obliquely obovate-oblong lobes 1.5–1.75 cm. long; anthers 5 mm. long; ovary 3 mm. long, nectaries about half as long; stigma 2 mm. long; follicles 2–3 dm. long, the seeds about 1 cm. long with bright tawny coma twice as long.—F.M. Neg. 4484.

Cajamarca: Near Tabaconas, 1,500 meters, *Weberbauer 6243.*—San Martín: San Roque, *Williams 7368.*—Huánuco: Santo Domingo, trailing on rocky slope, *4242.* Cuchero, *Ruiz & Pavón,* type.—Junín: La Merced, *5246; Killip & Smith 23410.* Chanchamayo, *Isern 2326.*—Ayacucho: Río Apurímac Valley near Kimipitriki, *Killip & Smith 22932.* Aína, *Killip & Smith 22741.*—Loreto: Yurimaguas, *Poeppig 33.* Pongo de Manseriche, *Tessmann 4918* (det. Markgraf, *M. trifida*). Bolivia.

Mesechites trifida (Jacq.) Muell. Arg. in Mart. Fl. Bras. 6, pt. 1: 151. 1860; 630. *Echites trifida* Jacq. Enum. Pl. Carib. 13. 1760. *E. japurensis* Stadelm. Flora 24, pt. 1: Beibl. 19. 1841. *M. japurensis* (Stadelm.) Muell. Arg. l.c. 152. *E. dichotoma* HBK. Nov. Gen. & Sp. 3: 217. 1819. *M. dichotoma* Miers, Apocyn. S. Am. 233. 1878.

Similar to *M. acuminata* but glabrous or essentially, leaves ovate to ovate-oblong, sometimes oblong-lanceolate, firm-membranous; inflorescence usually but half as long as leaves; pedicels 5–10 mm. long; corolla tube about 1.5 mm. across at base, the lobes 7.5–15 mm. long; anthers 4–6 mm. long; ovary about 2 mm. long; seeds about 7.5 mm. long.—Apparently could be defined to include *M. acuminata* as a variant (as by Markgraf) and it is possible that the following specimens, essentially glabrous, are rather referable to the Ruíz and Pavón entity or race. F.M. Neg. 20145 (*E. japurensis*).

Cajamarca: Jaén Bracamoros, *Bonpland* (type, *E. dichotoma*).—San Martín: San Roque, *Williams 6128; 7460* (det. Markgraf and Woodson).—Loreto: Yurimaguas, *Williams 5291* (det. Woodson).—Ayacucho: Aína, *Killip & Smith 22520* (det. Woodson). Ecuador to Trinidad and Central America. "Ahuashi-yacu" (Williams).

20. MANDEVILLA Lindl.

Echites of authors, in part, not P. Br.

Reference: Woodson, Ann. Mo. Bot. Gard. 20: 645–777. 1933.

More or less ligneous and varying in habit from erect-ascending herbs to lianas, the opposite or verticillate leaves usually with several inconspicuous glands along the midrib or approximate at base and the petioles commonly joined by a stipular ring. Inflorescence ordinarily lateral and simply racemose. Calyx lobes imbricate with 5 inner squamellae. Corolla infundibuliform, salverform or tubular-salverform. Anthers truncate or obtusely biauriculate. Stigma pentagonal-umbraculiform. Nectaries 2–5, rarely obsolete. Seeds truncate, comose.—In Peru the species are lianas, except *M. cuspidata* and *M. Vanheurckii*, the leaves are opposite, and, except in the latter, the stems are terete. Lindley in 1840 named "this beautiful twiner after Henry John Mandeville, Esq. H. B. M. Minister of Buenos Ayres, to whom we are indebted for the introduction."

A key based largely on vegetative characters is provided for fruiting or imperfect specimens; many more species than the comparatively few as yet recorded are to be expected within Peru, especially from the Amazonian basin.

KEY (after Woodson)

Corolla tube quite straight; squamellae many, alternate with calyx lobes or continuous; leaf midrib glands or gland basal.

- Corolla salverform or tubular-salverform; anthers truncate or merely emarginate at base.
  - Nectaries 5.
    - Corolla clearly salverform, the well-defined limb reflexed or spreading.
      - Leaves petioled; calyx lobes lanceolate or ovate-lanceolate.
        - Corolla limb to one-half as long as tube.
          - Corolla tube about 1 cm. long, about twice as long as limb.............................*M. scutifolia.*
          - Corolla tube 1.5–2.5 cm. long, several times as long as limb...........................*M. callacatensis.*
        - Corolla limb more than half as long as tube.
          - Bracts minute..........................*M. riparia.*
          - Bracts foliaceous.......................*M. Lobbii.*
      - Leaves sessile, amplexicaul; calyx lobes ovate-subreniform. *M. subsessilis.*
    - Corolla tubular-salverform, the ill-defined limb erect or suberect.
      - Leaves obtuse or rounded at base.........*M. cercophylla.*
      - Leaves strongly cordate...................*M. brachyloba.*
  - Nectaries obsolete........................*M. subpaniculata.*
- Corolla infundibuliform.
  - Lianas; inflorescence lateral.
    - Nectaries 5; nodal appendages 1–3 mm. long.
      - Inflorescences opposite or potentially so....*M. glandulosa.*
      - Inflorescences alternate only...................*M. laxa.*
    - Nectaries 2; nodal appendages obscure.......*M. boliviensis.*
  - Erect or suffrutescent herb with terminal racemes. *M. cuspidata.*

Corolla tube somewhat gibbous, sometimes slightly; squamellae as many as calyx lobes and opposite them; leaves glandular along midrib.

- Corollas salverform, the orifice somewhat constricted.
  - Flowers subsessile, ascending at full anthesis; leaves firm. *M. antennacea.*
  - Flowers shortly pedicellate, soon spreading-reflexed; leaves thin-membranous..........................*M. subsagittata.*

Corollas infundibuliform to subsalverform, the orifice not constricted.
  Lianas with terete stems.
    Corollas showy, yellow-red, not secund.
      Corolla throat subtubular; petioles to 2.5 cm. long. *M. Pavonii.*
      Corolla throat conical to long-campanulate; petioles short.
        Corolla throat conical; leaves subcoriaceous. . .*M. scabra.*
        Corolla throat long-campanulate; leaves membranous. *M. Trianae.*
    Corollas small, greenish-yellow, secund. . . . .*M. polyantha.*
  Erect or clambering undershrub with partly alate stems. *M. Vanheurckii.*

VEGETATIVE KEY

Leaf with midrib gland or glands basal; calyx scales continuous or alternate with lobes; corolla tube straight.
  Leaves sessile or essentially.
    Racemes terminal; leaves 5–10 cm. long; half shrub. *M. cuspidata.*
    Racemes lateral; leaves a dm. long or longer; liana. *M. subsessilis.*
  Leaves petioled, sometimes shortly but obviously.
    Leaves basally rounded, obtuse or acute.
      Petioles about 5 mm. long; leaves subcoriaceous; corolla lobes suberect. . . . .*M. cercophylla.*
      Petioles a cm. or two long; leaves membranous; corolla lobes spreading-reflexed.
        Corolla salverform, about 3 cm. long; nectaries 5. *M. callacatensis.*
        Corolla funnelform, about 5 cm. long; nectaries 2. *M. boliviensis.*
    Leaves more or less cordate, sagittate or auriculate, sometimes obscurely.
      Inflorescence about half as long as ample (–2 dm. long) leaves; nectaries obsolete. . . . .*M. subpaniculata.*
      Inflorescence about as long as or longer than the often medium-sized leaves; nectaries 5.

Corolla funnelform; nodal appendages 0.5–3 mm. long.
  Leaves often 1–1.5 dm. long, tomentulose beneath. *M. glandulosa.*
  Leaves often shorter than 1 dm., glabrate...... *M. laxa.*
Corolla salverform or tubular-salverform; nodal appendages minute or obsolete.
  Flowers not secund.
    Leaves glabrate...................... *M. scutifolia.*
    Leaves tomentulose beneath.
      Bracts minute...................... *M. riparia.*
      Bracts foliaceous...................... *M. Lobbii.*
  Flowers secund...................... *M. brachyloba.*
Leaves with several glands along the midrib above; calyx scales opposite lobes; corolla tube more or less gibbous.
  Leaves more or less cordate to sagittate at base; stems terete.
    Pedicels 1–3 (4) mm. long; leaves somewhat coriaceous, often tomentulose beneath.
      Bracts about 7 mm. long or longer, subacute; corolla salverform.............................. *M. antennacea.*
      Bracts 1–5 mm. long, acuminate; corolla funnelform. *M. scabra.*
    Pedicels (4) 5–10 mm. long; leaves more or less membranous.
      Petioles usually or mostly 4–6 mm. long.
        Corolla salverform, soon spreading-recurved; leaves usually glabrate......................... *M. subsagittata.*
        Corolla funnelform, ascending, the throat long-campanulate; leaves typically tomentulose beneath. *M. Trianae.*
      Petioles usually 1.5–2.5 cm. long.
        Flowers not secund, often reddish; pedicels little accrescent. *M. Pavonii.*
        Flowers secund at least in some degree, greenish-yellow; pedicels elongating.................. *M. polyantha.*
  Leaves acute at base; stems irregularly alate.... *M. Vanheurckii.*

Mandevilla antennacea (A. DC.) Schum. Naturl. Pflanzenfam. 4, pt. 2: 171. 1895; 741. *Echites antennacea* A. DC. Prodr. 8: 456. 1844. *Amblyanthera antennacea* (A. DC.) Muell. Arg. Linnaea 30:

448. 1860. *Laseguea antennacea* (A. DC.) Miers, Apocyn. S. Am. 251. 1878.

Stems and leaves beneath, especially the younger, more or less softly puberulent-tomentulose, the former soon glabrate, the latter minutely strigillose to glabrate above, glandular along the midrib; petioles 5 mm. long; leaves elliptic-ovate to oblong-lanceolate, obscurely sagittate at base, acute to acuminate, 5–12 cm. long, 1.5–6 cm. wide, chartaceous to subcoriaceous; racemes lateral, usually at least as long as the subtending leaves and often with many (–50) crowded yellowish flowers on ascending pedicels 1–2 mm. long; bracts petaloid, oblong, obtuse to broadly acute, 7.5–12 mm. long; calyx lobes scarious, oblong-lanceolate, 2–3 mm. long, glabrous or irregularly puberulent-papillate, the opposite solitary squamellae subtrigonal, erose; corollas salverform, glabrous, the tube 2.5–3 cm. long, about 2 mm. across at base, distinctly gibbous, slightly enlarged at insertion of stamens, the obliquely ovate or obovate lobes reflexed or spreading, 1.5–2 cm. long; anthers auriculate, 4 mm. long; ovary ovoid, glabrous, the stigma 1.5 mm. long; nectaries 5, ovoid-trigonal; follicles obscurely articulated, to 2 dm. long, the seeds 7.5 mm. long with brilliant tawny coma 2 cm. long.—Type described from a Pavón specimen in Herb. Boissier (Geneva) without data. Flowers vivid yellow, orange-striped or red-flushed at base, tube white without; latex abundant (Woytkowski). F.M. Neg. 34139.

San Martín: Moyobamba, *Weberbauer 4488*. Tarapoto, *Woytkowski 35012; 35032; 35033* (det. Cuatrecasas); *Williams 5863* (det. Markgraf). Zepelacio, *Klug 3266* (det. Standley).—Junín: Chanchamayo Valley, *Schunke 349; 389; 391*. Colonia Perené, *Killip & Smith 25407*.—Loreto: Yurimaguas, *Killip & Smith 27581; Kuhlmann 21849; Williams 3889; 4013; 7837; Poeppig*, type. Near Iquitos, *Klug 674; 821*. Pongo de Manseriche, *Tessmann 5064; 3587*. Bolivia; Amazonian Brazil. "Pus-poroto" or "poroto del monte" (Woytkowski).

Mandevilla boliviensis (Hook. f.) Woods. Ann. Mo. Bot. Gard. 20: 716. 1933. *Dipladenia boliviensis* Hook f. Bot. Mag. 95: *pl. 5783*. 1869.

Liana, glabrous, even the showy white flowers, or the leaves usually sparsely glandular at the base of the midrib above; petioles 1– about 2 cm. long; nodal appendages obsolete or obscure, at least the upper; leaves elliptic to obovate-elliptic, obtuse at base, caudate-acuminate, 6–10 cm. long, 2–4 cm. wide, the somewhat shorter racemes 3–7-flowered; pedicels 1.5–2 cm. long; bracts minute, ovate, scarious as the ovate-lanceolate acuminate calyx lobes, these 4–5 mm. long, the squamellae in groups of 4–6; corollas infundibuliform, the straight tube 1.5–1.75 cm. long, about 1.5 mm. across at base, the narrowly conical throat 2.25–2.5 cm. long, to 1 cm. in diameter at orifice, the widely spreading shortly acuminate lobes 2–3 cm. long; anthers auriculate, 1 cm. long; ovary glabrous, the 2 nectaries half as long; stigma 2 mm. long.—The type was by Pearce, purportedly from Bolivia.

Peru (undoubtedly). Ecuador; Bolivia.

Mandevilla brachyloba (Muell. Arg.) Schum. Naturl. Pflanzenfam. 4, Abt. 2: 171. 1895; 670. *Amblyanthera brachyloba* Muell. Arg. Linnaea 30: 423. 1860.

Resembles the closely related *M. cercophylla* but more or less puberulent (or glabrate in age) including the many (15–40) -flowered racemes that somewhat exceed the leaves; petioles 1–4 cm. long; leaves ovate to ovate-oblong, abruptly and broadly cordate and rather abruptly acuminate, 4–12 cm. long, 2–6 cm. wide, membranous, sometimes barbate in the nerve axils; bracts 1.5–3 mm. long; calyx lobes 2–2.5 mm. long; corollas densely glandular-papillate, reddish or deep purple (drying black), the tube 1.5–1.75 mm. long, about 1.5 mm. across at base, the lobes 2–3 mm. long; ovary and stigma subequal, 1.5 mm. long; follicles continuous or obscurely articulated, 2–3 dm. long; seeds 1.25 mm. long, the pale tawny coma about 2 cm. long.—Simulates *M. Pentlandiana* (DC.) Woods. 671, of Bolivia, with calyx lobes 1–1.5 cm. long! F.M. Neg. 31788.

Junín: Pariahuanca, *Mathews 820*, type.—Huancavelica: Below Surcobamba, Valley of the Mantaro, 1,900 meters, *Weberbauer 6498*.—Apurímac: Pacachacos Valley, *West 3790* (det. Johnston). Near Abancay, *Goodspeed Exped. 10551; Vargas 751* (det. Standley). Marcapata Valley, *Weberbauer 7850* (det. Markgraf).—Puno: Sandía, 2,100 meters, *Weberbauer 536*. To Argentina.

Mandevilla callacatensis Mgf. Notizbl. Bot. Gart. Berlin 9: 83. 1924; 663.

Lianas; stems and leaves (either surface) minutely puberulent-papillate to glabrate; petioles 1–2 cm. long; leaves opposite, broadly ovate to oblong-elliptic, obtuse or rounded but not cordate at base, acute to abruptly acuminate, 2.5–6 cm. long, 1.5–4 cm. broad, membranous, sparsely glandular above at base of midrib; nodal appendages obscure; racemes somewhat longer than subtending leaves, the 5–12 yellowish flowers on pedicels 1–1.25 mm. long; bracts oblong-lanceolate, 1.5–2 mm. long; calyx lobes lanceolate, acuminate, 2–3 mm. long, granulous-puberulent, the squamellae indefinitely placed; corolla salverform, glabrous, the straight tube 2–2.5 cm. long, about 1.5 mm. thick at base, the reflexed or spreading obliquely ovate lobes 5 mm. long; stamens inserted near orifice of tube, the truncate anthers 5 mm. long; ovary oblong-ovoid, about twice as long as the compressed ovoid nectaries; follicles about 3 dm. long, seeds 7.5 mm. long, the brilliant tawny coma 1.5 cm. long.—F.M. Neg. 31789.

Cajamarca: Callacati, Río Chotano Valley, Prov. Cutervo, 1,400 meters, *Weberbauer 7128*, type; *Jelski 375*.

Mandevilla cercophylla Woods. Ann. Mo. Bot. Gard. 19: 61. 1932; 669.

Liana, completely glabrous even including the lateral 1–17 (type) -flowered racemes of greenish-yellow or roseate flowers; petioles 5 mm. long; leaves obovate-oblong, somewhat cuneate to the obtuse or rounded (not cordate) base, acuminate or subcaudate, 3–6 cm. long, 1–3 cm. wide, subcoriaceous, glandular above at base of midrib; peduncle flexuose, the racemes shorter than subtending leaves; pedicels to 1 mm. long, the obscure bracts scarious as the ovate-trigonous acute 1 mm. long calyx lobes; squamellae scattered; corollas tubular-salverform, the straight tube 1.25 mm. long, about 1 mm. across at base, the erect or suberect obliquely ovate lobes 5 mm. long; stamens near orifice, anthers 4.5 mm. long, truncate; ovary oblong-ovoid, 1.5 mm. long, stigma twice as long, nectaries half as long; follicles (immature) obscurely articulated, to 1.5 dm. long.

Huánuco: Casapi, (*Mathews 1978*, type).

Mandevilla cuspidata (Rusby) Woods. Ann. Mo. Bot. Gard. 20: 730. 1933. *Dipladenia cuspidata* Rusby, Bull. N. Y. Bot. Gard. 4: 410. 1907.

Erect, suffrutescent, usually more or less puberulent-pilosulous, rarely glabrous; leaves sessile or subsessile, suborbicular to ovate or broadly oblong-elliptic, rounded and usually obscurely cordate at base, very abruptly and shortly acute to acuminate, 5–10 cm. long, 2–7 cm. wide, firm-membranous, sparsely glandular at the midrib base; nodal appendages if obvious obscure; racemes terminal, few-flowered, usually much longer than the subtending leaves; pedicels 1–2 cm. long; bracts and calyx lobes scarious, lanceolate to ovate-lanceolate, 3–5 mm. long and 5–10 mm. long, the squamellae in alternate groups of 2–4; corollas cream-colored or flushed with pink, infundibuliform, the tube to 2 cm. long, about 2.5 mm. across at base, the narrow throat 2–3.25 cm. long, to 1.5 cm. wide at orifice, the acuminate lobes 2.5–3 cm. long or longer, widely spreading; anthers auriculate, 7 or 8 mm. long; ovary ovoid-oblongoid, 1–2 mm. long, glabrous; stigma 2 mm. long; nectaries 2–5, more or less dissimilar in size and shape, usually lobed or emarginate when fewer than 5.—Nectary variation here provides one of the most cogent arguments against the validity of *Dipladenia;* sometimes scarcely separable from the more eastern *M. illustris* (Vell.) Woods., 727 (Woodson).

Cuzco: Valle de Santa Ana, Pumachaca, *Herrera 3282.* Bolivia.

Mandevilla glandulosa (R. & P.) Woods. Ann. Mo. Bot. Gard. 19: 66. 1932; 692. *Echites glandulosa* R. & P. Fl. Peruv. 2: 19, *pl. 135.* 1799. *Prestonia peruviana* Spreng. Syst. 1: 637. 1825. *Haemadyction glandulosum* (R. & P.) A. DC. Prodr. 8: 427. 1844. *Odontadenia glandulosa* (R. & P.) Schum. Naturl. Pflanzenfam. 4, Abt. 2: 169. 1895.

More or less softly tomentulose liana, especially the young stems and leaves beneath; petioles 1.5–2 cm. long; leaves broadly ovate to ovate-lanceolate, openly cordate at base, acuminate, 8–15 cm. long, 4–8 cm. wide, membranous, puberulent or glabrate above, glandular at base of midrib; nodal appendages 1–3 mm. long; flowers greenish-white or cream-colored, 15–20 in lax lateral racemes about twice as long as the leaves; pedicels 3–3.5 cm. long; bracts and acuminate calyx lobes scarious, lanceolate, the former 3–4 mm., the latter 5–6 mm. long, puberulent; corollas infundibuliform, glabrous or minutely papillate, the straight tube 2–2.25 cm. long, about 2 mm. in diameter at base, the narrowly conical throat 1.5–1.75 cm. long, about 5 mm. wide at orifice, the spreading shortly acuminate lobes 2 cm. long; anthers emarginate, 6 mm. long; ovary ovoid-oblongoid, puberulent-papillate; nectaries truncate, about 1 mm. long; follicles slightly if at all articulate, 3–3.5 dm. long.—Williams collections referred in herb. by Markgraf to the similar *M. veraguensis* (Seem.) Hemsl., 690, with purple flowers, anthers basally truncate. F.M. Neg. 4515.

San Martín: San Roque, *Williams 7242; 7245.*—Huánuco: Muña, *Ruiz & Pavón*, type. Yanano, *3730.* Molinopampa, *Weberbauer 4384.*

Mandevilla laxa (R. & P.) Woods. Ann. Mo. Bot. Gard. 19: 68. 1932; 695. *Echites laxa* R. & P. Fl. Peruv. 2: 19, *pl. 134.* 1799. *M. suaveolens* Lindl. Bot. Reg. 26: *pl. 7.* 1840, fide Woodson. *M. Bridgesii* (Muell. Arg.) Woods. l.c. 67 (*M. Mandoni* Britton, Bull. Torrey Club 25: 496. 1898, fide Woodson), at least as to Peru.

Slender- or rather stout-stemmed liana, more or less puberulent when young, especially on the leaf-veins beneath; petioles 1–3 cm. long; nodal appendages 0.5–2 mm. long; leaves ovate, more or less openly cordate at base, acutely acuminate, to about 12 cm. long, mostly a fourth to a third as wide, firm-membranous, glandular at base of midrib, the 7–9 straight strongly ascending lateral nerves prominent beneath; peduncles often well exceeding the subtending leaves, the usually 5–10 showy flowers rather crowded at their tips on pedicels 1–1.5 cm. long, the slender nearly scarious bracts about half as long; calyx lobes sublinear or narrowly lanceolate, acuminate, about 1 cm. long, the several scales more or less definitely grouped; corolla infundibuliform, glabrous, the tube proper about 1 cm. long, 2–3 mm. across at base, more or less greatly exceeded by the tubular-conical throat, this often to 2 cm. long, 4–5 mm. wide at orifice, the lobes 1.5–2 cm. long; anthers obscurely auriculate; ovary glabrous; stigma about 4 mm. long; nectaries 5, 1 mm. long; follicles (Bolivian specimens) 1.5–3 dm. long, seeds about 7 mm. long, coma 2 cm. long. —The plant of southern Peru allied to *M. Bridgesii* with puberulent leaves may not be a part but, as Woodson notes, the plants closely approach. Stems often lavender-tinted, the flowers fragrant, and the plant cultivated, according to Herrera, for its beauty; flowers white, flushed with pink (Stafford). F.M. Neg. 28219.

Huánuco: Pillao, Chacahuasi, *Ruiz & Pavón*, type.—Cuzco: Ollantaitambo, Urubamba Valley, *Stafford 1043; Herrera 862; 3123; 3344.* Ecuador; Bolivia?

Mandevilla Lobbii Woods. Ann. Mo. Bot. Gard. 26: 95. 1939.

Puberulent leaves faintly glabrate; petioles 5 mm. long; leaves opposite, ovate-elliptic, rounded-subcordate, at base acutely acuminate, 3.5–6 cm. long, about 2–3 cm. wide, firm-membranous, few-glandular on midnerve at base; racemes simple, the 4–7 flowers on pedicels 1 cm. long; bracts obovate-elliptic, acuminate, 6–10 mm. long, persisting; calyx lobes lanceolate, acuminate, 6–7 mm. long; scales much attenuate; corolla salverform, glabrous or faintly papillate, the straight or nearly straight tube 18 mm. long, the shortly acuminate-obovate lobes 1.5 cm. long, spreading; anthers glabrous, 7 mm. long, truncate or nearly at base; nectaries 5, emarginate, much shorter than ovary.—Closely allied to the Ecuadorian *M. Jamesonii* Woods. but differing in the strikingly developed bracts which recall several species of the subgenus *Exothostemon* (author); the type without data but probably from Peru or Ecuador, in Peru affine, apparently *M. riparia*.

Peru (?): (*Lobb*, type, Herb. Vienna).

Mandevilla Pavonii (A. DC.) Woods. Ann. Mo. Bot. Gard. 19: 73. 1932; 749. *Echites hirsuta* R. & P. Fl. Peruv. 2: 19, *pl. 136*. 1799, not *M. hirsuta* (Rich.) Muell. Arg. *E. Pavonii* A. DC. Prodr. 8: 463. 1844. *Amblyanthera Pavonii* (A. DC.) Muell. Arg. Linnaea 30: 450. 1860.

Indument more or less ferrugineous, early hispidulous on the rather stout stems, minute on the leaves (tomentulose beneath, strigillose above), a puberulence on the infundibuliform-subsalverform reddish-yellow flowers; petioles to 2.5 cm. long; leaves elliptic-obovate, somewhat auriculate at base, abruptly subcaudate-acuminate, 8–11 cm. long, 3–6 cm. wide, membranous; racemes lateral, somewhat shorter than the subtending leaves; pedicels 6–8 mm. long; minute ovate bracts as ovate lanceolate acute calyx lobes scarious, the latter 2–3 mm. long, the opposite solitary squamellae truncate; corolla tube 3–3.5 cm. long, weakly gibbous, somewhat inflated above the submedial insertion of the stamens, about 1 mm. across at the base, 3–3.5 mm. at the orifice, the widely spreading lobes 2–2.25 cm. long; anthers auriculate, 4.5 mm. long; ovary and apiculate stigma each about 2 mm. long, equaled by the oblongoid nectaries.—F.M. Negs. 4529; 29213; 29214.

San Martín: Tocache, *Poeppig 1840*.—Huánuco: Pueblo Nuevo, *Ruiz & Pavón* (type, *E. hirsuta*).—Loreto: Mishuyacu, near Iquitos, *Klug 57; 1288*. Florida, Río Putumayo, *Klug 2212* (det. Standley), Ecuador. "Iquidia-o" (Huitoto).

Mandevilla polyantha Schum. ex Woods. Ann. Mo. Bot. Gard. 19: 73. 1932; 769.

Stems and leaves above pilose or pilosulose to glabrate, the far-extended lateral racemes with 20 or more greenish-white or yellowish flowers secundly borne on 1 cm. long pedicels that are notably accrescent in age; petioles 1–1.5 cm. long; leaves usually broadly elliptic to obovate-elliptic, or the upper oblong-elliptic, rather narrowly and obscurely cordate, acuminate, 7 (3) –12 (7) cm. long, 3–6 cm. wide, membranous, laxly puberulent beneath especially on veins and midrib, this glandular above; bracts minute, linear, scarious as the ovate acute puberulent calyx lobes, these 1 mm. long; squamellae opposite, solitary, deltoid, denticulate; corollas infundibuliform, glabrous, the tube very gibbous, ventricose, 1–1.25 cm. long, 1.5 mm. broad at base, the conical throat about 1 cm. long, 5 mm. across at the orifice, the widely spreading lobes 2.5 mm. long; anthers 3 mm. long, not prominently auriculate; ovary glabrous, the 1 mm. long stigma apiculate; follicles strongly articulated, 1.5–2 dm. long, seeds 1 cm. long, coma about twice as long.—Related to *M. Moritziana* (Muell. Arg.) Donn. Sm., 768, which it simulates and to which Markgraf referred in herbarium Williams' collections, but that Venezuelan species, according to Woodson, has petaloid bracts 1–2 cm. long (!). F.M. Neg. 640302.

Loreto: Yurimaguas, *Ule 6271*, type; *Killip & Smith 27579; Williams 3897; 4735; 7857.* Balsapuerto, *Klug 3098* (det. Standley).

Mandevilla riparia (HBK.) Woods. Ann. Mo. Bot. Gard. 19: 58. 1932; 665. *Echites riparia* HBK. Nov. Gen. & Sp. 3: 214. 1819. *M. montana* (HBK.) Mgf. var. *peruviana* Mgf. Notizbl. Bot. Gart. Berlin 9: 82. 1924, fide Woodson.

Rather slender terete-stemmed finely puberulent to glabrate liana; petioles to 2 cm. long; leaves ovate-lanceolate to -oblong, abruptly and rather broadly cordate, acute to acuminate, 4–9 cm. long, 1.5–4 cm. wide, puberulent to glabrate both sides, sometimes barbate in the axils beneath, glandular at base of midrib, nervation prominent; racemes lateral, 8–12-flowered, about as long as the subtending leaves; pedicels to 1 cm. long; bracts lanceolate, 2 mm. long; calyx lobes lanceolate, acuminate, 5–7 mm. long, scarious, puberulent, the squamellae indefinitely disposed; corolla yellowish- and red-tinted, salverform, glabrous or papillate, the straight tube to 1.5 cm. long, 1.5 mm. thick at base, the obliquely obovate-oblong spreading lobes about 12 mm. long; stamens near orifice of tube, the truncate anthers 5 or 6 mm. long; ovary glabrous, the stigma 4–5 mm. long, the nectaries compressed obovoid.—Perhaps, as considered by Markgraf, a variant of *M. montana* of Colombia with corolla limb about a third as long as tube, instead of more than half as long; type (from Colombia) not studied by Woodson. Fruits to 2 dm. long; leaves vivid green above, pale tomentose beneath, the fine tomentum on stems, pedicels and midribs brown (Stork & Horton). F.M. Neg. 38734.

Cajamarca: Cutervo, *Weberbauer 7131* (type, *M. montana* var. *riparia*). Socota, *Stork & Horton 10151.* Ecuador; Colombia.

Mandevilla scabra (Roem. & Schult.) Schum. in Naturl. Pflanzenfam. 4, Abt. 2: 171. 1895; 752. *Echites scabra* Roem. & Schult. Syst. 4: 795. 1819. *Amblyanthera versicolor* (Stadelm.) Muell. Arg., var. *olivacea* Muell. Arg. in Mart. Fl. Bras. 6, pt. 1: 147. 1860, at least as to Peru.

Younger stems more or less puberulent-pilose; petioles 2–6 mm. long; leaves elliptic to oblong-elliptic, mostly 5–7 cm. long, half as wide or to about half or twice as large, obscurely cordulate, acute or abruptly short-acuminate, more or less coriaceous, puberulent to gibbous above, cinereous tomentulose beneath (at least in Peru); racemes lateral, usually 5–10-flowered; bracts narrowly lanceolate, acuminate, 5–10 mm. long, more or less scarious as the scarcely broader acuminate puberulent calyx lobes, these 2–3 mm. long, the solitary opposite scale trigonal-ligular; corolla glabrous or puberulent to pilosulous, the gibbous tube 1.5–3 cm. long, about 1.5 mm. across at base, the conical throat to 2 cm. long, 1–1.5 cm. across at orifice, the spreading lobes 1.5–2 cm. long; anthers 7 mm. long, auriculate; ovary glabrous or papillate, about equaled by the 5 nectaries; stigma shortly apiculate; follicles not or slightly articulated, 1–2.5 dm. long, glabrous or a little puberulent, the seeds about 7 mm. long, coma twice as long.—After Woodson, except in part to conform to the Peruvian species which accord well except for mostly smaller leaves; and *Williams 5903* has pilosulous flowers; the more coriaceous leaves are sometimes rather rugose, suggesting the apparently too similar *M. rugosa* (Benth.) Woods. 754. Determinations, except as noted, by Markgraf, who referred the Williams collections to "var. *olivacea*," presumably the synonym cited above. Stem reddish or wine-red as sometimes calyx, the corolla vivid yellow (Woytkowski).

San Martín: Near Moyobamba, *Woytkowski 35294* (det. Cuatrecasas); *Weberbauer 4488,* part. Tarapoto, *Woytkowski 35029* (det. Cuatrecasas); *Williams 5643* (det. Woodson); *5382; 5405; 5903.* Lamas, *Williams 6387.* To the Guianas and Colombia. "Clavohuasca" (Williams).

Mandevilla scutifolia Woods. Ann. Mo. Bot. Gard. 19: 57. 1932; 663.

Resembles *M. callacatensis;* petioles 10–12 mm. long; leaves ovate to ovate-oblong, abruptly and obscurely cordate at base, 2–5 cm.

long, 1.5–3 cm. wide, irregularly puberulent above, barbate in the axils beneath; bracts ovate-lanceolate, 2–3 mm. long; calyx lobes ovate-lanceolate, acute to acuminate, 3–3.5 mm. long, the squamellae in alternate groups of 3 or 4; corolla tube 10–12 mm. long; stamens about medially inserted, the anthers 0.4 mm. long; follicles unknown.

Peru(?): Andes of Saragosa, (*Lobb*, type).

Mandevilla subpaniculata Woods. Ann. Mo. Bot. Gard. 19: 71. 1932; 678. *Echites macrophylla* Zahlbr. Ann. Naturh. Hofm. Wien 7: 5. 1892, not *M. macrophylla* (HBK.) Schum.

Stems early puberulent; petioles 3–5 cm. long; leaves ovate to broadly ovate-oblong or rarely even suborbicular, 1.5–2 dm. long, 10–13 cm. wide, broadly cordate at base, abruptly acuminate to obtuse or rounded, membranous, glandular at base of midrib, densely puberulent on both sides or tomentulose beneath; inflorescence lateral or subterminal, about half as long as leaves, rather obscurely subpaniculate, 10–20-flowered; pedicels 5 mm. long; bracts minute, ovate, scarious, as the ovate acute calyx lobes; squamellae in alternate groups of 2–6; corollas white or yellowish, salverform, puberulent-papillate, the straight tube 1.25 cm. long, 1.15 mm. across at base, the spreading obliquely obovate lobes 1–1.25 mm. long; stamens inserted near base, anthers 5–6 mm. long, slightly concave basally; ovary glabrous, oblongoid, 1 cm. long, stigma 3 mm. long; nectaries obovate.

Cajamarca: Tambillo, *Jelski 32*. Ecuador.

Mandevilla subsagittata (R. & P.) Woods. Ann. Mo. Bot. Gard. 19: 69. 1932; 743. *Echites subsagittata* R. & P. Fl. Peruv. 2: 19. 1799. *E. hirtiflora* A. DC. Prodr. 8: 456. 1844.

Allied to *M. antennacea* but variable in indument to glabrous, the leaves thin-membranous, oblong-elliptic, early narrowly lanceolate, more or less narrowed to base and abruptly auriculate or usually almost subhastate, acuminate, or infrequently obtuse or rounded, mucronulate, to a dm. long, 3 cm. wide, the petioles to 1 cm. long; flowers yellow or reddish on finally reflexed pedicels 4–6 mm. long; bracts and calyx lobes scarious, the former lanceolate, 1–5 mm. long, the latter 1–1.5 mm. long, sometimes sparsely pilosulous, the solitary trigonal-ligular squamellae usually erose; corolla tube 2–2.5 cm. long, more or less narrowing toward insertion of stamens, the acuminate lobes 1–1.5 cm. long; anthers 5 mm. long; stigma 3 mm. long; nectaries usually retuse; follicles conspicuously reticulated, 1–2 dm. long, the tawny coma of the seeds about 1.5 cm. long. —See Woodson, l.c. 743–744, for a large synonymy. The type, based on a specimen labeled Pavón, probably was by another collector and from Mexico; true also for several other species in this family, as *E. membranacea* A. DC. l.c. 457. F.M. Neg. 29216.

Cajamarca: Valley of the Río Tabaconas, Prov. Jaén, *Weberbauer 6270.*—San Martín: Tarapoto, *Spruce; Mathews 1327; Woytkowski 35028; Williams 5608; 5620; 35031; 6079; 6680; 6681* (det. Markgraf).—Huánuco: Cuchero, *Ruiz & Pavón*, type; *Poeppig 1233.* Pozuzo, *4720.* Casapi, (*Mathews 1977*).—Junín: La Merced, *5404.* To Mexico and Trinidad.

Mandevilla subsessilis (DC.) Woods. Ann. Mo. Bot. Gard. 19: 59. 1932; 667. *Echites subsessilis* DC. Prodr. 8: 451. 1844.

Glabrate liana, well marked by the sessile or subsessile broadly ovate to orbicular leaves that are cordate-amplexicaul at base, obtuse to very abruptly acuminate, at least a dm. or so long, 6 or 7 cm. wide, glabrate or nearly above (glandular at base of midrib), softly puberulent on the nerves beneath; racemes lateral with about 15 pale yellow flowers on pedicels 1 cm. long, the scarious lanceolate acuminate bracts half as long; calyx lobes scarious, ovate-subreniform, obtuse to rounded, 5–5.5 mm. long, the squamellae in alternate groups of 4 or 5; corolla salverform, glabrous, the straight tube 2 cm. long, about 1.5 mm. thick at base, the obliquely obovate lobes about as long; anthers 5 mm. long, truncate or slightly concave at base; ovary glabrous, ovoid, stigma 4 mm. long; nectaries compressed obovoid.—Without data but the reproductive morphology indicates an indubitable affinity with the species of northern South America (Woodson).

Peru(?): Without locality, (*Pavón*, type).

Mandevilla Trianae Woods. Ann. Mo. Bot. Gard. 19: 70. 1932; 760.

Stems, leaves, especially beneath, and reddish-yellow flowers softly to minutely puberulent; petioles 3–6 mm. long; leaves ovate to ovate-lanceolate, narrowly cordate, acute or acuminate, 6–12 cm. long, 2–4 cm. wide, membranous, glandular along the midrib; racemes lateral, about as long as the leaves, the 6–10 pedicels 4–6 mm. long; lanceolate bracts and calyx lobes scarious, the former 4–5, the latter 1–2 mm. long; squamellae opposite, solitary, deltoid, erosulate; corollas typically infundibuliform, glabrate, the gibbous tube to 2 cm.

long, about 1.5 mm. wide at base, the narrowly campanulate throat 1.5–1.75 cm. long, 7 mm. across at orifice, the spreading lobes puberulent, the apiculate stigma 2 mm. long; nectaries 5, oblongoid.—Corolla delicate salmon-red, yellow within, pale yellow without below (Woytkowski).

Junín: Hacienda Schunke, La Merced, *5812* (det. Woodson).—Loreto: Aguaitia, *Woytkowski 34424* (det. Cuatrecasas). Florida, Río Putumayo, *Klug 1980* (det. Woodson). To Colombia.

Mandevilla Vanheurckii (Muell. Arg.) Mgf. Notizbl. Bot. Gart. Berlin 9: 87, *fig. 2L.* 1924; 771. *Heterothrix Vanheurckii* Muell. Arg. in Van Heurck and Muell. Arg. Obs. Bot. 164. 1871. *Eriadenia obovata* Miers, Apocyn. S. Am. 117. *pl. 14B.* 1878, fide Markgraf. *M. glabra* N. E. Br. Trans. Linn. Soc. Bot. ser. 2. 6: 47. 1901.

Stems irregularly alate, often supported in other shrubs, the entire plant glabrous except the scarious puberulent-papillate calyx lobes, these ovate, acute, 1–2 mm. long; petioles to 1 cm. long; leaves in type obovate or often elliptic to obovate-lanceolate, acute or attenuate at base, acute or obtuse to subcaudate, 5–8 cm. long, 1.5–3 cm. wide, coriaceous, glandular along the midrib above; racemes lateral or subterminal, ordinarily somewhat larger than leaves, the several to 12 or more yellowish flowers on pedicels 2–3 mm. long; bracts ovate, scarious, 1 mm. long; squamellae solitary, deeply lacerate; corollas infundibuliform, the somewhat gibbous tube 2–3 cm. long, 1.5 mm. across at base, the shortly conical throat 1.5–2 cm. long, 1 cm. wide at orifice, the widely spreading lobes 1.5 cm. long; anthers obscurely auriculate, 6–7 mm. long; ovary ovoid, puberulent, the 5 nectaries a third as long; follicles slightly articulated, 1–1.5 dm. long, seeds 6 or 7 mm. long, the tawny coma twice as long.—F.M. Negs. 26855; 31792.

San Martín: Tarapoto, *Spruce 4303*, type. Moyobamba, 1,300 meters, *Weberbauer 4740*. Zepelacio, *Klug 3639*.

21. NERIUM L.

Shrubs or sometimes tree-like with coriaceous, eglandular, usually ternate leaves and terminal thyrsiform inflorescence of many showy variously colored flowers. Calyx lobes more or less imbricate, equal, with numerous scales at base within. Corolla infundibuliform, the throat near apex with petaloid, mostly 5-cleft appendages. Anther tips somewhat exserted, connivent and sticking to stigma, the enlarged, basally lobed connective apically appendiculate. Ovary apocarpous, annulus none, stigma fusiform. Follicles 2, free, the many puberulent seeds comose.

Nerium Oleander L. Sp. Pl. 209. 1753.

Commonly several meters tall; leaves oblong-lanceolate, narrowed to base, acuminate, often about a dm. long or longer, 1–3 cm. wide or wider, lustrous above; calyx lobes acuminate; corolla tube 8–12 mm. long, throat conical, about 1 cm. long, the spreading lobes 2–2.5 cm. long; follicles to 1.5 dm. long.—Established outside of cultivation at Tarapoto and Huánuco and doubtless elsewhere.

San Martín: Tarapoto, *Williams 5947.*—Huánuco: Along trails, *Woytkowski 105.* Mediterranean region to the Orient. "Laurel," "Oleander."

22. MALOUETIA A. DC.

Robbia A. DC. Prodr. 8: 444. 1844.

Reference: Woodson, Ann. Mo. Bot. Gard. 22: 238–270. 1935.

Lactescent shrubs or small trees, the branches usually dichotomous or opposite, the leaves eglandular above but often with a single pit in the nerve axils beneath, the inflorescence umbellate, terminal or sometimes also lateral. Calyx lobes within with alternate solitary or rarely geminate glandular squamellae. Corolla salverform, exappendiculate within but sometimes notably calloused in the orifice. Anthers completely included or almost completely exserted; filaments free. Carpels apocarpous, united apically, the stigma fusiform-subcapitate. Nectaries 5. Follicles sometimes solitary by abortion, narrowly terete to broadly fusiform, usually somewhat divaricate or foliate, the many dry glabrous or more or less villous seeds ecomose.

Leaves membranous, puberulent beneath .... *M. Killipii.*
Leaves subcoriaceous, glabrous .... *M. peruviana.*

Malouetia Killipii Woods. Ann. Mo. Bot. Gard. 18: 551. 1931; 262.

Tree known to attain 10 meters, the branchlet tips and especially the leaves beneath densely velutinous puberulent; lenticels rather inconspicuous; petioles 3–7 mm. long; leaves narrowly oblong- to broadly ovate-elliptic, obtuse to rounded at base, obtusely and narrowly subcaudate-acuminate, 1.5–2.5 dm. long, 5–12 cm. long, membranous, glabrous and slightly lustrous above; umbels terminal or rarely also lateral, the greenish-white flowers several; peduncles to 5 mm. long; pedicels to 1 cm. long; calyx lobes ovate, obtuse to broadly acute, 1.5–2.5 mm. long, about twice as wide, closely imbricate at anthesis, papillose on both surfaces; corolla salverform, rather sticky and waxy, the tube 11–12 mm. long, the faucal tube 1 mm. long, 1.5–2 mm. wide, prominently callose-annulate, puberulent within toward insertion of stamens, the obliquely ovate lobes 9–12 mm. long, reflexed, papillate without; anthers well exserted, puberulent as ovary, this 1 mm. long, the nectaries to three-fourths as long.—*M. pubescens* Mgf. Notizbl. Bot. Gart. Berlin 9: 88. 1924, of Amazonian Brazil, has leaves sparsely pilose above, ovate calyx lobes about twice as long as wide, anthers hirsute, pubescent pedicels to 5 mm. long (Woodson), and smaller flowers.

Loreto: Iquitos, *Killip & Smith 29860,* type. Mishuyacu, *Klug 79.*

Malouetia peruviana Woods. Ann. Mo. Bot. Gard. 22: 259. 1935.

Tree, sometimes 15 meters tall, completely glabrous except the puberulent-papillate calyx lobes and corollas within; lenticels obscure; petioles 3–5 mm. long; leaves narrowly oblong- or ovate-elliptic, acutely or subcaudately acuminate, 5–20 cm. long, 1.5–8.5 cm. wide, subcoriaceous, lustrous above, beneath opaque and prominently foveolate in the nerve axils; flowers several, greenish-white; peduncles 2–5 mm. long; pedicels 1–1.5 mm. long; calyx lobes ovate or broadly acute, 2.5–4 mm. long, subcoriaceous, strongly imbricate, papillate or glabrate on both sides; corolla waxy, the tube 12–15 mm. long, scarcely if at all dilated to 3 mm. broad at apex where prominently callosed, the acute lobes 12–17 mm. long, reflexed, papillate to glabrate on both sides; anthers conspicuously exserted, ovate-elliptic, 4–5 mm. long, glabrate or glabrous; ovary puberulent, the nectaries to two-thirds as long.—*M. tamaquarina* (Aublet) A. DC. and *M. furfuracea* Spruce, to which the Peruvian tree has been referred, have corolla lobes puberulent within and are otherwise different (Woodson). Williams, Field Mus. Bot. 15: 423–424. 1936, under these names described the wood and noted the latex as bitter or fairly sweet; the species may be too narrowly defined.

San Martín: Tarapoto, *Spruce 4611* (det. Markgraf, *M. tamaquarina*).—Loreto: Near Iquitos, *Killip & Smith 27004,* type; *27371; Klug 972; 1266; 1359.* Caballo-cocha, *Williams 2089; 2216.* Timbuchi on Río Nanay, *Williams 928; 973.* Amazonian Brazil. "Cuchara-caspi" (Williams).

23. **FORSTERONIA** G. F. W. Meyer

Reference: Woodson, Ann. Mo. Bot. Gard. 22: 153–224. 1935.

Lactescent more or less ligneous lianas (rarely clambering shrubs) with opposite or alternate branches, opposite or rarely verticillate leaves, these ordinarily with a pit in the axils of the midrib and primary nerves beneath, and rotate or subrotate flowers in terminal (or also lateral) thyrsoid inflorescences. Calyx lobes imbricate with 1–several squamellae or none. Corolla neither appendaged nor the orifice annulate. Filaments (in Peru) exappendiculate, free or agglutinated to the style. Stigma fusiform or subelliptic. Nectaries 5. Follicles more or less agglutinated; seeds many, truncate, comose.—All of the Peruvian species are twining lianas, the bark conspicuously lenticellate when mature; species as delineated are defined basically on floral characters; a vegetative key for the few Peruvian species has been attempted.

KEY (after Woodson)

Anther tips exserted, often barely so, or essentially included; filaments free.
  Anthers 1 mm. long, or shorter, the tips barely or scarcely exserted. *F. gracilioides.*
  Anthers 0.125–2 cm. long, the tips usually obviously exserted.
    Ovary clearly 2-lobed, apocarpous.
      Anther tips somewhat barbellate; leaves large. *F. Benthamiana.*
      Anther tips glabrous; leaves 4–7 cm. long...... *F. brevifolia.*
    Ovary more or less 5-lobed by pressure of nectaries, syncarpous toward base.................................. *F. decipiens.*
Anthers wholly exserted; filaments adhering to style at least above.
  Leaves glabrous beneath or barbellate in the axils.
    Corolla about 5 mm. long, white.............. *F. tarapotensis.*
    Corolla about 3.5 mm. long, yellowish-green........ *F. galbina.*
  Leaves uniformly puberulent beneath............. *F. pubescens.*

VEGETATIVE KEY

Leaves lanceolate to oblong-elliptic, about a third as wide as long. *F. tarapotensis.*
Leaves rather broadly elliptic or obovate, about half as wide as long.

Inflorescence lax, terminal, well-exceeding leaves; flowers about 2.5 mm. long . . . . *F. gracilioides.*

Inflorescence narrow, subspiciform (or branches subspiciform), sometimes longer than leaves; flowers 3.5 mm. long, bracts prominent . . . . *F. decipiens.*

Inflorescence broadly thyrsiform or corymbose; flowers 3.5 mm. long or longer.

  Leaves glabrous or barbellate in the axils.

    Flowers white; anther tips usually obvious.

      Leaves 8–18 cm. long, thyrse (terminal) usually as long or longer . . . . *F. Benthamiana.*

      Leaves 4–7 cm. long, corymbs (even terminal) little or not longer . . . . *F. brevifolia.*

    Flowers yellowish-green; anthers exserted; leaves 4.5–8 cm. long . . . . *F. galbina.*

  Leaves softly puberulent beneath; anthers exserted. *F. pubescens.*

Forsteronia Benthamiana Muell. Arg. in Mart. Fl. Bras. 6, pt. 1: 106. 1860; 170. *Thyrsanthus Benthamiana* (Muell. Arg.) Miers, Apocyn. S. Am. 95. 1878.

Glabrous except for the puberulent-papillate thyrsiform inflorescences, these both terminal and lateral, the former usually much exceeding the leaves; stems conspicuously lenticellate when quite mature; petioles 3–7 mm. long; leaves oblong-elliptic to broadly oval, broadly obtuse or rounded at base, abruptly short-acuminate to rounded at apex, to 18 cm. long, 8 cm. wide, often smaller, coriaceous or subcoriaceous, somewhat lustrous above and glandular at base of midrib; pedicels 1–3 mm. long; scarious bract and calyx lobes ovate or ovate-lanceolate, the former to 3.5 mm. long, the latter 1–2 mm. long; squamellae solitary, alternate; corolla tube (indument minute or obsolete) 1.5–3 mm. long, to 2 mm. across at apex, villosulous within, the spreading lobes about oblong, 2–3 mm. long; filaments free, the barbellate anther tip visible; ovary ovoid, apocarpous, puberulent-papillate; stigma included, 1– nearly 2 mm. long; follicles undulated, often united at tip, over 2 dm. long; seeds 2 cm. long or longer, the bright tawny coma to 2 cm. long.—F.M. Neg. 4555.

Loreto: Near Iquitos, *Klug 1053; Tessmann 5128; 3639.* Pongo de Manseriche, *Tessmann 4461; 4805.* Balsapuerto, *Klug 2849? 3041?* (young). Amazonian Brazil.

Forsteronia brevifolia Mgf. Notizbl. Bot. Gart. Berlin 10: 1038. 1930; 173.

Resembles *F. Benthamiana* but inflorescences corymbose-thyrsiform, flat-topped or only a little convex, the terminal as lateral about equaling or somewhat exceeding the leaves, these broadly elliptic to obovate-elliptic, 4–7 cm. long, 2–3.5 cm. wide; bracts shorter than 1 mm.; calyx lobes ovate to deltoid, obtuse or rounded, 1 mm. long or slightly longer; corolla tube to 1.5 mm. long; anthers glabrous, a little exserted; stigma 2 mm. long.—F.M. Neg. 4556.

Loreto: Mishuyacu, near Iquitos, *Klug 640* (det. Markgraf). Amazonian Brazil.

Forsteronia decipiens Woods. Ann. Mo. Bot. Gard. 22: 181. 1935.

Character in general similar to that of *F. Benthamiana;* petioles 6–11 mm. long; leaves 7.5–13 cm. long, about 3–8 cm. wide, firm-membranous; inflorescences narrowly and rather subspiciform-thyrsiform, the terminal sometimes longer than the subtending leaves; pedicels to 1.2 mm. long, accrescent in fruit; bracts more or less foliaceous, the somewhat spatulate larger to 5 mm. long, the smaller at the pedicels narrowly lanceolate; calyx-lobes to 2.5 mm. long; squamellae not observed; corolla tube 1–1.2 mm. long, about 1.5 across at apex, the spreading lobes to 2 mm. long; anthers slightly exserted at tips, sparsely barbellate or glabrate; ovary evidently syncarpous or the carpels agglutinated, the nectaries about as long; follicles rigid, horizontally divaricate, 10–13 cm. long; seeds 1.6 mm. long, the pale tawny coma 4–4.5 cm. long.—Klug collections referred by Standley to *F. montana* Muell. Arg. of eastern Brazil, similar.

San Martín: Tarapoto, *Williams 5897; 6120; 6156.* — Loreto: Balsapuerto, *Klug 2905*, type; *3104* (fr.), cotype, *Klug 2849.*

Forsteronia galbina Woods. Ann. Mo. Bot. Gard. 22: 198. 1935.

Most similar in Peru to *F. tarapotensis* but the inflorescence in type terminal and very broadly thyrsiform, almost subcorymbose, about equaling the leaves, nearly papillate-puberulent and the smaller flowers yellow-green; leaves oval or obovate-elliptic, obtuse or minutely acuminate, 4.5–8 cm. long, nearly 3–4 cm. wide; pedicels to 1.5 mm. long; bracts lanceolate, acuminate, to 1 mm. long; calyx lobes to 1.25 mm. long; squamellae more or less connate; corolla tube 0.7–1 mm. long, to 1.75 mm. wide at apex, the glabrate lobes 2.5 mm. long; stigma about 1 mm. long.—Resembles *F. myriantha* Donn. Sm.

of Central America but that has white flowers, the lobes puberulent within; the author suggests that the fruits, when known, may show the relationship.

Loreto: Flood-free woods, mouth of the Santiago, *Tessmann 3967*, type.

Forsteronia gracilioides Woods. Ann. Mo. Bot. Gard. 22: 163. 1935. *F. affinis* Muell. Arg. in Mart. Fl. Bras. 6, pt. 1: 100, *pl. 30.* 1860, as to Peru.

Stems glabrous becoming conspicuously lenticellate; petioles 4–8 mm. long; leaves obovate to obovate-oblong, obtuse at base, shortly and abruptly subcaudate acuminate, 5–8 cm. long, 2–4 cm. wide, firm-membranous, glabrous above but glandular at base of midrib, glabrate or sparsely puberulent beneath especially in the nerve axils; terminal thyrse well exceeding the leaves, regularly branched, more or less densely puberulent, at least the pedicels, these 1–2 mm. long; bracts as calyx lobes scarious and ovate-lanceolate, the former to 1.5 mm. long, the latter to 1 mm. long; squamellae minute, in alternate group; corolla densely puberulent-papillate, the tube to 1 mm. long, to 0.125 mm. wide at orifice, villosulous within as the broadly oblong spreading obtuse lobes, these at least 1 mm. long; filaments free, anthers essentially included, conspicuously barbellate; ovary ovoid, apocarpous, papillate; follicles obviously articulated, foliate, about 4.5 dm. long, the seeds 2–2.5 cm. long with tawny coma 3 cm. long.—F.M. Neg. 28947 (Spruce).

San Martín: Tarapoto, *Spruce 4493* (det. Miers, *F. affinis*). Pongo de Cainarache, *Klug 2761*.—Junín: La Merced, *Weberbauer 1888*.—Loreto: Yurimaguas, *Williams 4547*, type; *4011*. Mouth of the Santiago, *Tessmann 4413*. Balsapuerto, *Klug 2932* (det. Standley).

Forsteronia pubescens A. DC. Prodr. 8: 436. 1844; 184. *Thyrsanthus placidus* Miers, Apocyn. S. Am. 101. 1878?

Mature stems copiously lenticellate, the flowering branchlets, leaves beneath and terminal thyrsiform inflorescence (this usually longer) densely puberulent except the flowers; petioles 4–8 mm. long; leaves broadly oval to oblong-elliptic, obtuse to ovate at base and apex or sometimes acuminate, usually about 5–10 cm. long, 2.5–6 cm. wide, membranous, glabrate above, obscurely glandular at base; pedicels 1–2 mm. long; bracts ovate to lanceolate, 0.7–6 mm. long, more or less scarious as calyx-lobes (Peru), these ovate to ovate-lanceolate, acute to acuminate, 1–2 mm. long, obscurely puberulent-papillate without, the narrowly linear squamellae 5–6 times as many as the lobes; corolla essentially glabrous without, tube 0.7–1.2 mm. long, densely villosulous within, the narrowly oblong spreading lobes 3–5 mm. long, pilosulous within; filaments agglutinated to style, anthers glabrous, wholly exserted; ovary apocarpous; follicles often somewhat foliate, glabrous, 11–27 cm. long, seeds 9–12 mm. long, bright tawny coma 2.5–3.5 mm. long.—After Woodson, as elsewhere; the range is somewhat unusual but not exceptional by any means, but as the anthers are said to be partly included in the Peruvian plant this may become var. **placida** (Miers) Macbr., comb. nov. F.M. Neg. 4561.

San Martín: Juanjuí, *Klug 3846* (det. Standley). Tarapoto, (*Spruce 4295*, type, *I. placidus*). To southeastern Brazil.

Forsteronia tarapotensis Schum. ex Woods. Ann. Mo. Bot. Gard. 22: 195. 1935.

Liana, glabrous except the terminal densely thyrsiform-subspicate inflorescence, this much shorter than the subtending leaves and densely puberulent even to the white corollas, the indument then minute; petioles 3–5 mm. long; leaves lanceolate to oblong-elliptic, obtuse at base, acuminate, 4.5–10 cm. long or somewhat longer, about 1.5–3 cm. wide, firm-membranous, obscurely glandular at midrib base; pedicels to 0.5 mm. long; calyx lobes ovate-lanceolate, acute, to 2 mm. long, slightly if at all foliaceous; squamellae minute, many, not in group; corolla tube 1.5 mm. long, to 2 mm. wide at apex, villous within as also the widely spreading oblong-ovate lobes, these 3.5–5.5 mm. long; filaments agglutinated to style, the glabrous anthers wholly exserted; ovary ovoid, apocarpous, puberulent-papillate; stigma about 2 mm. long.—Miers, Apocyn. S. Am. 243. 1878, referred *Spruce 4908* to *F. Pavonii* A. DC., reported without data as originating in Peru; it was no doubt from Mexico from another collector, and is *Apocynum cannabinum* L. var., fide Woodson. F.M. Neg. 4567.

San Martín: Near Tarapoto, *Spruce 4908; Ule 6561*, type; *Williams 3891; 5611* (det. Markgraf).—Loreto: Yurimaguas, *Williams 3891*.

24. SECONDATIA A. DC.

Reference: Woodson, Ann. Mo. Bot. Gard. 22: 224–232. 1935.

Like *Forsteronia* but leaves eglandular, salverform flowers sometimes few, squamellae 1 or rarely paired, filaments short.

Secondatia peruviana Poeppig, Nov. Gen. & Sp. 3: 71, *pl. 281.* 1845; 227.

Glabrous, or essentially, rather slender-stemmed liana with many small white flowers in terminal and lateral subcorymbose inflorescences much shorter than the subtending leaves; petioles 7–15 mm. long; leaves ovate-elliptic, obtuse to rounded at base, abruptly subcaudate acuminate, 5–10 cm. long, about half as wide, membranous, nearly concolor; pedicels 2–5 mm. long; bracts as calyx lobes ovate, scarious, the former 1–2 mm. long, the latter 1–1.5 mm. long; corolla tube about 7 mm. long, slightly narrowed to orifice, puberulent within, the glabrous rounded spreading lobes 4–5.5 mm. long; anthers glabrous; nectaries concrescent at base of ovoid ovary.—Immature follicles broadly fusiform; perhaps a variant of the widely distributed (Paraguay to the Guianas) *S. densiflora* A. DC. with apparently no substantial distinction except that the anthers of the eastern species are puberulent dorsally. F.M. Neg. 4480.

Huánuco: Cuchero and Pampayacu, *Poeppig 1582,* type.—Loreto: Mouth of the Santiago, *Tessmann 4359.*

25. ODONTADENIA Benth.

Reference: Woodson, Ann. Mo. Bot. Gard. 22: 270–306. 1935.

Lactescent lianas, the branches of the twining stems sometimes alternate above, the leaves eglandular, the thyrsoid to simply scorpioid inflorescences lateral or also terminal with few to many often showy infundibuliform or rarely salverform flowers. Calyx lobes sometimes very unequal, the squamellae within 5 to many, alternate or scattered. Corolla tube straight or slightly gibbous, not appendaged within. Filaments short, usually pilosulous. Carpels united apically by the fusiform or subcapitate obscurely maniculate or 5-digitate stigma. Nectaries 5, usually concrescent.—The form of the stigma is notably variable from fusiform to strikingly umbraculiform (cf. *O. laxiflora*) but the character, all species considered, apparently is developed in degree.

For convenience a supplementary key is provided.

KEY (after Woodson)

Inflorescence thyrsiform-subcorymbose; calyx lobes at least a little unequal; lenticels often finally prominent.

Corolla clearly infundibuliform, the throat much dilated; stipules 2, caducous, laminate, scarious or none.

Stamens inserted below dilation of throat.

Leaves not cordate; nectaries fleshy, not 2-lobed.

Corolla throat about 5.5 cm. across.

Calyx lobes 5.5–8 mm. long; inflorescence terminal. *O. cognata.*

Calyx lobes 4–5.5 mm. long; inflorescence lateral. *O. affinis.*

Corolla throat about 1 cm. across.............*O. Killipii.*

Leaves obscurely cordate; nectaries membranous, 2-lobed. *O. cordigera.*

Stamens inserted at base of corolla throat.......*O. lauretiana.*

Corolla salverform or nearly, the tube little dilated; stipules several. *O. anomala.*

Inflorescence not thyrsiform; calyx lobes subequal; lenticels obscure or obsolete.

Corollas (2.1) 2.5–8 cm. long; stigma fusiform, often manicate.

Inflorescence both terminal and lateral; nectaries multifid; anthers hirsute.

Corolla 5–8 cm. long, the throat longer than broad. *O. macrantha.*

Corolla 3–4 cm. long, the throat about as broad as long. *O. stemmadeniaefolia.*

Inflorescence lateral; nectaries 5-lobed; anthers glabrous or puberulent.............................*O. geminata.*

Corollas to 2.1 cm. long; stigmas subcapitate, digitate. *O. laxiflora.*

SUPPLEMENTARY KEY

Flowers 2–4 cm. long; inflorescence lateral at least in part (except *O. cognata*).

Calyx lobes 4–8 mm. long; inflorescence thyrsiform or corymbose.

Corolla at least in bud pulverulent; inflorescence terminal. *O. cognata.*

Corolla glabrous; inflorescence lateral...............*O. affinis.*

Calyx lobes 2–2.5 mm. long; inflorescence not thyrsiform.

Inflorescence shorter than leaves, few-flowered or the branches few-flowered....................*O. stemmadeniaefolia.*

Inflorescence longer than leaves, often many-flowered. *O. laxiflora.*

Flowers 5–8 cm. long; inflorescence terminal (except *O. cordigera, O. geminata*), also lateral (*O. macrantha*).

Inflorescence ordinarily lateral, at least in part.

Inflorescence many-flowered, corymbose-thyrsiform; leaves rounded.................................*O. cordigera.*

Inflorescence dichasially cymose or pseudoracemose; leaves usually acute.

Leaves membranous, little if at all lustrous; nectaries multifid. *O. macrantha.*

Leaves coriaceous, lustrous above; nectaries 5-lobed. *O. geminata.*

Inflorescence terminal.

Corolla funnelform; stipules obsolete or obscure, or, in *O. cognata*, laminate.

Inflorescence much shorter to about as long as leaves. *O. macrantha.*

Inflorescence thyrsiform, usually elongate.

Lenticels finally prominent; corolla throat to 2.5 cm. long; leaves mostly about half as wide as long.

Corolla glabrous; calyx lobes 2–3 mm. long. .*O. Killipii.*

Corolla pulverulent; calyx lobes 5 mm. long. .*O. cognata.*

Lenticels faint; corolla glabrous, the throat to 3.5 cm. long; leaves about a third as wide as long. . . . .*O. lauretiana.*

Corolla salverform; stipules several...............*O. anomala.*

Odontadenia anomala (Van Heurck & Muell. Arg.) Macbr. Field Mus. Bot. 11: 35. 1931; 295. *Anisolobus anomalus* Van Heurck & Muell. Arg. Obs. Bot. 160. 1871. *Perictenia stipellaris* Miers, Apocyn. S. Am. 183, *pl. 28.* 1878.

Stems, leaves above and the terminal densely fasciculate thyrsiform inflorescences more or less densely rusty hirtellous, at least minutely; stipules many, filiform, to 1 mm. long; petioles 1–1.5 cm. long; leaves opposite or subverticillate at ends of branchlets, obovate, broadly obtuse at base, rounded with an abrupt short acumen at apex, 1–2 dm. long, 6–13 cm. wide, persistently tomentose beneath; pedicels 7.5 mm. long, the persisting bracts 5–7.5 mm. long; calyx lobes notably unequal, broadly ovate, obtuse, 3–4 mm. long, the solitary squamellae deeply and unevenly cleft and divided; corollas yellow, orange-tinted, salverform, glabrous or puberulent above, the cylindric tube somewhat dilated at apex, 2.5–3 cm. long, about 2 mm. broad at base, the spreading obovate acuminate lobes about 3–4 cm. long; stamens affixed nearly at base of corolla tube, the oblong-linear anthers puberulent toward tip; carpels ovoid, lamellose; stigma fusiform; nectaries tubular, erose, about twice as long as ovary, puberulent.—F.M. Neg. 4513.

San Martín: Tarapoto, *Spruce 4900*, type; *Ule 6562*.—Loreto: Pongo de Manseriche, *Tessmann 4034*.

Odontadenia affinis Woods. Ann. Mo. Bot. Gard. 18: 549. 1931; 280.

Glabrous, the rather slender stems not conspicuously lenticellate even at maturity; petioles 5–8 mm. long; leaves oblong-ovate, subacute at base, shortly and obtusely subcuspidate-acuminate, 6–8 cm. long, 3.5–4 cm. wide, subcoriaceous, opaque; inflorescence lateral, thyrsiform, relatively few-flowered, somewhat shorter than the subtending leaves, bracts obscure, pedicels about 5 mm. long; calyx lobes ovate, subobtuse, more or less unequal, 4–5.5 mm. long, sometimes ciliolate, the scales in alternate groups of 3 or 4; corolla infundibuliform, glabrous, the tube to 17 mm. long, conical throat to 23 mm. long, about 5.5 mm. across at orifice, the obliquely obovate lobes 1.5–2 cm. long; stamens inserted below throat, lanceolate-sagittate anthers 5 mm. long, minutely papillate dorsally; ovary broadly ovoid, 1.5 mm. long, the fusiform stigma about 2 mm. long, the annular nectary much shorter than the ovary.—Affine *O. cognata* (author) with terminal inflorescence, larger leaves, more sunken ovary.

Loreto: Balsapuerto, *Killip & Smith 28609*, type.

Odontadenia cognata (Stadelm.) Woods. Ann. Mo. Bot. Gard. 18: 546. 1931; 273. *Echites cognata* Stadelm. Flora 24, pt. 1: Beibl. 79. 1841. *O. augusta* Woods. l.c. 548, fide Woodson.

Glabrous except the puberulent-papillate corymbose-thyrsiform terminal inflorescences of many reddish-tinged yellow or salmon-colored flowers; petioles a cm. or two long; leaves oblong- to obovate-elliptic, obtuse to attenuate at base, acute to acuminate, 8–17 cm. long, 3–9 cm. wide, firm-membranous or chartaceous, opaque; stipules 2, ovate-trigonal, acuminate, 3–4 mm. long, caducous pedicels 1–1.5 mm. long, somewhat accrescent in fruit; bracts caducous, ovate, 2–4 mm. long, scarious as the unequal ovate-oblong obtuse or rounded calyx lobes, these 5.5–8 mm. long, the squamellae in alternate series of 2–6; corolla infundibuliform, densely velvety papillose, the tube

1.2–2 cm. long, about 3.5 mm. wide at base, 5–10 mm. across at apex, the broadly dolabriform obtuse lobes widely spreading, 1.5–1.8 cm. long; stamens inserted below throat-dilation, the anthers papillate dorsally; ovary ovoid, the concrescent nectary entire to crenate, to two-thirds as long; stigma fusiform, usually broadly 2-lobed.—In foliage and corolla dimensions recalls *O. Hoffmannseggiana* of similar distribution (Woodson). Peruvian specimens referred in herb. by Markgraf to *O. verrucosa* (R. & S.) Sch. (*A. Sprucei* (M. Arg.) Sch.) of Pará, Brazil, with greenish-yellowish flowers, somewhat shorter calyx lobes, internal scales 2–6, anthers minutely hirsute, stigma with 5 basal projections (according to Woodson).

Loreto: Flood-free woods, mouth of the Santiago, *Tessmann 4009; 4154; 4356*. Lower Río Huallaga, *Williams 4024*. Near Iquitos, *Williams 3743* (det. Markgraf, *O. Sprucei*); *Klug 327; 422; 657* (type, *O. augusta*). Panama; Amazonian Brazil.

Odontadenia cordigera Woods. Ann. Mo. Bot. Gard. 22: 282. 1935.

Completely glabrous, the mature stems closely lenticellate; stipules 2, reniform, 2 or 3 cm. long; petioles 5–7 mm. long; leaves obovate, obscurely cordate, rounded at apex, 7–8 cm. long, 4–6 cm. wide, opaque on both sides; inflorescences lateral, corymbose-thyrsiform with many bright yellow flowers on pedicels 4–5 mm. long, the ovate bracts 1 mm.; calyx lobes ovate, unequal, 3–4 mm. long, the alternate squamellae solitary or paired; corollas infundibuliform, the tube to 11 mm. long, about 1.5 mm. across at base, the narrowly conical throat 2 cm. or so long, 12 mm. across at orifice, the divaricate obovate lobes 17 mm. long; stamens affixed below the throat dilation, the linear acuminate auriculate anthers obscurely papillate; ovary oblongoid; stigma fusiform; nectaries unequal, incompletely concrescent.

Loreto: In dense forest at Mishuyacu, near Iquitos, *Killip & Smith 29916*, type.

Odontadenia geminata (Roem. & Schult.) Muell. Arg. in Mart. Fl. Bras. 6, pt. 1: 119. 1860; 302. *Echites geminata* Roem. & Schult. Syst. Veg. 4: 795. 1819.

Slender glabrous climber with obsolete or obscure stipules, mostly elliptic coriaceous leaves lustrous above and bracteate pseudo-racemes often many-flowered, and the peduncles 6 cm. long or longer, or 1–5-flowered, and the peduncle a cm. long; petioles 1 cm. long; leaves sometimes subovate or somewhat obovate, rounded at base, usually acutely and rather abruptly acuminate, 6–14 cm. long, 2–7 cm. wide, paler and subopaque beneath, the almost straight secondary nerves rather close; calyx 3–5 mm. long, the equal ovate lobes with 1 or 2 glands within; corolla light yellow, the throat sometimes red-purple, the tube 3 cm. long, 2–3 mm. wide, constricted above stamen insertion but at throat expanded to 1 cm., the obliquely elliptic lobes obtuse; stamens inserted medially, the anthers 1 cm. long, the tip slightly twisted, the filaments alately extended between the cells; follicles little if at all curved, 8–10 cm. long.—Formerly included in *O. nitida* (Vahl) Muell. Arg., 300, with tube widened and twisted above stamen insertion, the limb not broadly conical, the anthers inserted below the middle. The constancy and specific significance of these characters are a student's problem. F.M. Neg. 4518.

San Martín: Tarapoto, *Ule 6390* (det. Markgraf, *O. nitida*).—Loreto: Gamitanacocha, Río Mazán, *José Schunke 273* (det. Woodson). Balsapuerto, *Klug 2985* (det. Standley). Yurimaguas, *Ule 6272*. Near Iquitos, *Klug 1174*. Río Nanay, *Williams 674; 613; 638*. Maquisapa, *Williams 1197*. Caballo-cocha, *Williams 2306*. To Guiana; Colombia and Trinidad.

Odontadenia Killipii Woods. Ann. Mo. Bot. Gard. 18: 546. 1931; 281.

Glabrous, the relatively stout stems finally conspicuously lenticellate; petioles 1–1.5 cm. long; leaves broadly oblong-elliptic, subobtuse at base, abruptly and obtusely acuminate, 6–8 cm. long, 3–5 cm. wide; inflorescence terminal, thyrsiform, somewhat exceeding the subtending leaves, 15–20-flowered; bracts scarious, ovate, 2–3 mm. long; pedicels 5–7 mm. long; calyx lobes very unequal, ovate to ovate-oblong, 2–3 mm. long, 1–2-glandular within; corolla infundibuliform, tube 3–3.5 cm. long, about 2 cm. in diameter at base as the conical 2–2.5 cm. long throat at apex, the obliquely obovate-dolabriform lobes 2.5–3 cm. long; stamens inserted below throat, the linear sagittate anthers 3–4 mm. long; stigmas fusiform, 2 cm. long; nectary tubular, somewhat larger than the ovoid-oblongoid ovary.—Leaves drying with a bronze coloration as in *O. cognata* (Stadelm.) Woodson, with differently proportioned flowers.

Loreto: Flood-free woods near Iquitos, *Killip & Smith 29847*, type; *Tessmann 5100*.

Odontadenia lauretiana Woods. & Steyerm. Ann. Mo. Bot. Gard. 22: 289. 1935.

Stems early sparsely puberulent, glabrate, inconspicuously lenticellate at maturity; stipules unknown; petioles 12–17 mm. long; leaves elliptic-lanceolate, acute at base, acuminate, 9–12 cm. long, a third as wide, firm-membranous, glabrous, opaque; inflorescences terminal, thyrsiform, subcorymbose, about as long as the leaves, the many flowers cream-colored; pedicels 1.5 cm. long, glabrous; bracts to 3 mm. long; calyx lobes ovate-oblong, rounded, somewhat unequal, 7 mm. long or longer, papillate, ciliolate, the alternate squamellae solitary; corolla infundibuliform, sparsely papillate, the tube 12–14 mm. long, 2 mm. broad at base, markedly tapered toward apex, the tubular-conical throat 3.5 cm. long, 6 (–9) mm. in diameter at orifice, the spreading obliquely obovate lobes 15–18 mm. long; stamens affixed at base of tube, the annulate acuminate anthers glabrous; nectaries concrescent, crenulate, half as long as ovoid papillate ovary; stigma fusiform.—Provides a link between subgenera *Anisolobus* and *Eurodontadenia* (Woodson); its discovery suggests that the subgeneric division is contrary to reality. *O. Kochii* Pilger, 291, Amazonian Brazil, to which Markgraf referred this, has few-flowered lateral inflorescence.

Loreto: Fortaleza, Yurimaguas, *Williams 4385*, type.

Odontadenia laxiflora (Rusby) Woods. Ann. Mo. Bot. Gard. 19: 386. 1932; 305. *Laubertia laxiflora* Rusby, Bull. N. Y. Bot. Gard. 4: 408. 1907. *Codonechites paniculata* Mgf. Notizbl. Bot. Gart. Berlin 9: 80, *fig. 2.* 1924, fide Woodson.

Glabrous, slender-stemmed, not or obscurely lenticellate, the terminal and lateral inflorescences of small funnelform white or cream-colored flowers laxly and irregularly compound; stipules obsolete; petioles 4–6 mm. long; leaves oblong-elliptic, acute to obtuse at base, shortly subcaudate acuminate, 8–13 cm. long, 2.5–4 cm. wide, membranous or subchartaceous, lustrous above; pedicels 10–12 mm. long; bracts minute, scarious; calyx lobes ovate, subacute, 2–2.5 mm. long, the squamellae in alternate series of 2–4; corolla tube 6 or 7 mm. long, about 1.5 mm. across at base, the campanulate throat 7 or 8 mm. long, about 5 mm. across at orifice, the shortly acuminate lobes 5 or 6 mm. long; stamens affixed at base of throat, the auriculate acuminate anthers glabrous; nectaries fleshy, truncate, concrescent.—Markgraf proposed his genus *Codonechites* chiefly on the basis of the striking stigma head, which suggests a deeply scalloped partly open umbrella with a long conical tip; well illustrated by the author, l.c. Probably occurs within the southeastern Peruvian boundary. F.M. Neg. 4514.

Río Acre: Seringal San Francisco, *Ule 9698* (type, *C. paniculata*).

Odontadenia macrantha (Roem. & Schult.) Mgf. Fl. Surinam. 4, pt. 1: 461. 1937; 296. *Echites macrantha* Roem. & Schult. Syst. Veg. 4: 795. 1819. *O. Hoffmannseggiana* (Steud.) Woods. Bull. Torrey Bot. Club 60: 392. 1933. *E. Hoffmannseggiana* Steud. Nomencl. ed. 2. 1: 539. 1840, nomen nudum. *E. grandiflora* G. F. W. Meyer, Fl. Esseq. 131. 1818, not Miquel. *O. grandiflora* Miq. Stirp. Surinam. 166. 1850, based on another type.

Glabrous, the rather stout stems not or obscurely lenticellate, the few–many-flowered inflorescences ordinarily lateral, dichasially cymose, often much reduced, the broadly funnelform corollas with tube much shorter than throat; stipules obsolete; petioles to 2 cm. long; leaves broadly elliptic to obovate-lanceolate, acute to obtuse at base, usually shortly subcaudate-acuminate, mostly 1.5–2 dm. long, a third to a half as broad, membranous or chartaceous; pedicels 2–2.5 cm. long, the minute ovate bracts persisting; calyx lobes equal or nearly, broadly ovate, obtuse, 4–6 mm. long, the squamellae solitary or now and then geminate; corollas deep yellow tinged with red or orange, the tube 5–10 mm. long, 3–5 mm. across at base, strongly constricted at insertion of stamens—that is, at base of conical throat—this 2.5–3.5 cm. long, 1.25–1.75 cm. in diameter at orifice, the broadly acuminate lobes 2–3.25 cm. long; anthers elliptic-sagittate, densely hirtellous, nectary annulate, deeply multifid, half as long as the glabrous ovoid ovary; stigma fusiform; follicles somewhat falcate, 1.5–3 dm. long, 1–2 cm. thick; seeds 3–4 cm. long, the yellowish coma about as long. —F.M. Neg. 20157.

Loreto: Near Iquitos, *Klug 1026*. Río Mazán, *José Schunke 247* (det. Woodson); *Mexia 6457* (det. Standley). Florida, Río Putumayo, *Klug 2046*. Manfinja, *Williams 1094*. Brazil to the Guianas and Costa Rica.

Odontadenia stemmadeniaefolia Woods. Ann. Mo. Bot. Gard. 18: 548. 1931; 299.

Similar to *O. macrantha;* leaves more or less conspicuously cuneate at base; inflorescence rather irregularly dichasial or aggregate, the branches few-flowered; pedicels 10–13 mm. long; calyx lobes ovate-reniform, about 2 mm. long; scales in alternate groups of 2–3; corolla 3–4 cm. long, the throat about as broad as long, about 1 cm. across at orifice, the lobes 1.5–2 cm. long; anthers 8 mm. long; ovary about 1.5 mm. long.—May be found to merge with the similar species in which it was included by Markgraf, but apparently its closest relative is *O. speciosa* Benth. with flowers to twice as large, calyx lobes unequal (Woodson). Flowers orange and red or brick red (Klug).

Loreto: Mishuyacu near Iquitos, *Klug 782*, type. Río Mazán, *José Schunke 311* (det. Woodson). San Antonio, *Williams 3488* (det. Markgraf, *O. grandiflora* i.e., *O. macrantha*). Balsapuerto, *Klug 3052* (det. Standley).

26. PELTASTES Woods.

Shrubby, pubescent liana with large peltate opposite eglandular leaves and opposite axillary inflorescence (or rarely terminal) of rather few showy flowers. Calyx lobes decidedly foliaceous, with many scattered scales within. Corolla infundibuliform, the tube not appendaged, the dextrously contorted throat regular. Anthers connivent to stigma, with enlarged narrowly 2-lobed connective. Ovary apocarpous; stigma fusiform-subcapitate. Follicles separate, rather stout, the many rostrate seeds apically comose.—Unique in the *Nymphaea*-like leaves except *Stipecoma* M. Arg. with terminal salverform flowers, small bracts and calyx lobes with few scales, the single species quite glabrous.

Peltastes peltatus (Vell.) Woods. Ann. Mo. Bot. Gard. 19: 376. 1932. *Echites peltata* Vell. Fl. Flum. 110. 1825; Icon. 3: *pl. 32.* 1827. *Stipecoma peltata* (Vell.) Miers, Apocyn. S. Am. 134. 1878.

Character of the genus; the notably soft indument is ferrugineous. —Cf. *P. macrocalyx* (Muell. Arg.) Woods. l.c.; may be the same.

San Martín: Zepelacio, *Klug 3754* (det. Standley).—Huánuco: Divisoria, *Woytkowski 34492.* Brazil.

27. RHABDADENIA Muell. Arg.

Reference: Woodson, Ann. Mo. Bot. Gard. 23: 205–211. 1936.

Habit and gross characters of *Odontadenia* and related groups; stipules developed as a minutely appendiculate nodal ring; leaves eglandular; inflorescences a much reduced cyme, often 1-flowered, and with a simple bract. Calyx lobes nearly eglandular within. Anthers sagittate, acutely biauriculate with pilose connective. Stigma apically pilose. Nectaries 5, sometimes partly united. Seeds subcapiform, rostrate, comose.

Rhabdadenia macrostoma (Benth.) Muell. Arg. Linnaea 30: 435. 1860; 208. *Echites macrostoma* Benth. in Hook. Journ. Bot. 3: 248. 1841.

Stems early sparsely pilose as the petioles—these 3–5 mm. long—and the leaves beneath on the veins; leaves oblong-elliptic or -obovate, obtuse at the base, rather abruptly apiculate, 3–6 cm. long, 1.5–3.5 cm. wide, puberulent to glabrate above, membranous; cymes lateral, the peduncle about twice as long as the subtending leaves, with 2 pink or roseate flowers at the tip on pedicels 3–5 mm. long; bracts minute, lanceolate, scarious as the linear-lanceolate sparsely pilose or glabrate calyx lobes, these 2–4 mm. long; corolla funnelform, the narrowly cylindric tube to 1 cm. long, 1 mm. across at base, the broadly tubular throat 3–3.5 cm. long, 1 cm. across at the orifice, the obovate lobes 1.5 cm. long, stamens affixed at throat-base, the anthers oblong-lanceolate; ovary glabrous, somewhat longer than the nectaries; follicles 9–12 cm. long.

Loreto: Swampy thickets, near Iquitos, *Killip & Smith 26911; Williams 7985; 8069; Klug 762; 1290.* To the Guianas.

28. MACROPHARYNX Rusby

Reference: Woodson, Ann. Mo. Bot. Gard. 23: 268–271. 1936.

Lactescent fruticose lianas with opposite branches and leaves, the latter eglandular, adaxial pectinate stipular appendages and lateral usually opposite congested subumbellate inflorescences of a few showy greenish-white flowers, the bracts conspicuous. Calyx lobes 7–9 (at least Peruvian species), somewhat foliaceous and unequal, each with a single squamella within at base. Corollas (Peruvian) more or less infundibuliform, the straight tube exappendiculate. Anthers narrowly sagittate, acutely biauriculate. Nectaries 5, sometimes somewhat united. Follicles apocarpous, the many dry seeds comose.

Near La Merced the brown, slightly viscid sap was used with soap to increase the suds.

Macropharynx spectabilis (Stadelm.) Woods. Ann. Mo. Bot. Gard. 18: 552. 1931; 269. *Echites spectabilis* Stadelm. Flora 24, pt. 1: Beibl. 44. 1841. *M. fistulosa* Rusby, Mem. N. Y. Bot. Gard. 7: 329, *pl. 6*. 1927.

Stout-stemmed, more or less ferrugineous tomentulose or pilosulous even to the calyces, the stems and leaves glabrate in age; petioles 3–5 cm. long; leaves broadly ovate, rounded or subcordate at base, abruptly short-acuminate, 1–3 dm. long, about half as wide, firm-membranous or thick-subcoriaceous, finally somewhat lustrous above; peduncles about half as long as petiole, the bracts as calyx lobes subfoliaceous, linear, the former 4–12 mm., the latter 9–13 mm. long, acuminate; squamellae lanceolate; corollas sometimes subsalverform, glabrous or nearly, the tube 7–10 mm. long, 2–3 mm. across at base, the subtubular throat 1.3–4 cm. long, 4–8 mm. across at orifice, the obliquely obovate lobes 12–17 mm. long; stamens affixed at base of corolla throat, the anthers glabrous; ovary puberulent-papillate to glabrate, the nectaries at least as long; follicles to 2.5 dm. long, finally glabrate.—Steyermark's field note on his Ecuador specimen: young tips ferrugineous-brown; leaves dull green below, deep grass-green above; calyx grass-green; corolla greenish-white. F.M. Neg. 20152.

Junín: La Merced, *5612*.—Loreto: Mouth of the Santiago, *Tessmann 3607*. Near Iquitos, *Killip & Smith 27493; Klug 541; 1101*. Lower Nanay, *Williams 711*. Ecuador.

29. PRESTONIA R. Br.

Haemadictyon Lindl. Trans. Hort. Soc. 6: 70. 1825.

Reference: Woodson, Ann. Mo. Bot. Gard. 23: 276–367. 1936.

Upper branches sometimes alternate, leaves eglandular, nodes stipulate, the racemose, corymbose or subumbellate bracteate inflorescences lateral or subterminal. Calyx lobes equal, with a single glandular scale within. Corollas usually salverform with straight or rarely subgibbous tube, this often appendaged (appendages epistaminal), and an obscure thin or often conspicuous annulus in the throat. Anthers narrowly sagittate, the 2 parallel cells on an enlarged basally forked connective, the short filaments pubescent. Nectaries 5, separate or concrescent. Clavuncle fusiform. Follicles apocarpous, the comose seeds truncate or obscurely rostrate.—Species narrowly defined and much herbarium material inadequate for certain determination.

Calyx lobes only 2 mm. long, more or less reflexed . . . . *P. acutifolia*.
Calyx lobes about 5 mm. long or longer, not reflexed.
  Corolla glabrous to merely puberulent.
    Bracts conspicuous (sometimes caducous), foliaceous or petalaceous, mostly about 5 to many mm. long; appendages exserted or attaining orifice.
      Bracts narrowly oblong-lanceolate, green; leaves usually, anthers always, puberulent . . . . *P. mollis*.

Bracts rather elliptic, usually tinted; leaves as anthers glabrous. *P. robusta.*

Bracts minute, scarious, or slightly green when young.

Nectaries fleshy, slightly if at all united; calyx lobes firm, usually longer than 1 cm., oblong-elliptic, acute.

Appendages well included; anthers puberulent-papillate. *P. Phenax.*

Appendages slightly exserted; corolla tube as anthers glabrous.................................*P. trifida.*

Appendages well exserted; corolla tube as anthers puberulent....................................*P. vana.*

Nectaries thin to diaphanous, concrescent; calyx lobes thin, about 1 cm. long, oblong-lanceolate, acuminate. *P. lacerata.*

Corolla more or less densely pubescent.

Appendages visible at throat; annulus prominent; petioles rarely 2 cm. long.

Anthers glabrous, subincluded................*P. tomentosa.*

Anthers hispidulous, well exserted.............*P. cordifolia.*

Appendages merely linear ridges; petioles 1–4 cm. long. *P. Riedelii.*

Prestonia acutifolia (Benth.) Schum. in Naturl. Pflanzenfam. 4, Abt. 2: 188. 1895; 288. *Haemadictyon acutifolium* Benth. ex Muell. Arg. in Mart. Fl. Bras. 6, pt. 1: 167. 1860. *H. calignosum* Miers, Apocyn. S. Am. 260. 1878?

Older stems abundantly lenticellate, the younger often puberulent, otherwise glabrous; petioles to 2 (3) cm. long; leaves subelliptic, obtuse at base (or subcordate), acuminate (or mucronate), 6–16 (23) cm. long, 2–8 (10) cm. wide, firm-membranous, often early red-purple-veined, opaque; stipular dentiform appendages minute, many, intrapetiolar; racemes simple, usually somewhat shorter than the subtending leaves, the greenish-yellow flowers often many, on pedicels 5–12 mm. long; bracts as calyx lobes subfoliaceous, ovate-lanceolate, 1–2 mm. long, the latter acuminate, reflexed; squamellae deltoid-liguliform, lacerate or erose; corollas salverform, glabrous or merely a little papillate, the tube 1.5–2 cm. long, 4 mm. across at base, appendages 0.5–2 mm. long, entirely completed, the annulus strongly thickened, the acuminate lobes 7–10 mm. long; anthers rarely glabrate; ovary and nectaries subequal; follicles obscurely articulated, apically united, 2–4 dm. long; seeds 1 cm. long, the pale coma 3–4 cm. long.—The quite glabrous Peruvian plant, at least in part, has been named var. *latissima* Mgf. (Notizbl. Bot. Gart. Berlin 9: 982. 1926), petioles 2–3 cm. long, leaves subcordate, to 23 cm. long, 10 cm. wide, mucronate, inflorescence to 1.5 dm. long, 8 cm. broad.

San Martín: Tarapoto, *Spruce 4924* (type, *H. calignosum*); *Williams 5550; 6287; 6645; Woytkowski 35188* (det. Cuatrecasas).—Huánuco: Near Monzón, *Weberbauer 3605.*—Junín: La Merced, *5245; Killip & Smith 23387; Soukup 13515.*—Loreto: Near Iquitos, *Klug 1075; 1119.* Near Yurimaguas, *Killip & Smith 27840.* On the Ucayali, *Tessmann 3368.* Toward Pongo de Manseriche, *Tessmann 4816* (type, var. *latissima*); *Mexia 6370.* Río Mazán, *José Schunke 356.* Florida, *Klug 2105.* To Panama, Dutch Guiana and Argentina.

Prestonia cordifolia Woods. Ann. Mo. Bot. Gard. 23: 352. 1936.

Densely ferrugineous tomentulose, especially the stems, leaves beneath and the peduncles and pedicels (10–12 mm. long) of the simply corymbose inflorescences of 8–10 probably yellowish flowers; petioles 13–15 mm. long; stipular appendages only 3–4 on either side of node; leaves ovate-elliptic, basally cordate to rounded, abruptly acuminate, 6–12 cm. long, 4–9 cm. wide, firm-membranous, scabridulous-puberulous above; bracts as calyx lobes foliaceous, the former oblong-lanceolate, 1–1.5 cm. long, the latter ovate-oblong, acuminate, connate about one-third basally, 2–2.2 cm. long, softly rusty puberulous without, minutely so within; squamellae broadly obtuse, entire; corolla tube (and lobes) 2–2.2 cm. long, rusty hirtellous or puberulous and at stamen insertion near orifice retrorsely pilosulous, the oblong appendages conspicuously exserted, the annulus prominent; anthers hispidulous, well-exserted; nectaries scarcely lobed, greatly thickened, about half as long as ovary.

Cajamarca: Catache, Prov. Contumaza, *Raimondi 8228*, type.

Prestonia lacerata Woods. Ann. Mo. Bot. Gard. 23: 342. 1936.

Stems and leaves glabrous, the former abundantly lenticellate, the dichotomous corymbose inflorescences rusty or pale puberulent including the salverform yellowish corollas; petioles 1–1.5 cm. long; leaves oblong-elliptic, basally obtuse, abruptly acuminate-mucronate, 12–20 cm. long, half as wide, firm-membranous to subcoriaceous, somewhat lustrous only above; pedicels about 12 mm. long; bracts scarious, deltoid, acuminate, less than 1 mm. long; calyx lobes oblong-lanceolate, acutely acuminate, about 1 cm. long, membranous, herbaceous (purplish in drying), the trigonous squamellae entire; corolla tube 1.5 cm. long, softly puberulent within near stamen insertion, appendages linear, slightly exserted, annulus thick, the lobes 9 mm. long, reflexed; anthers puberulent, tip a little exserted; nectaries concrescent, membranous and purplish-hyaline above, deeply and unevenly lacerate, about twice as long as ovoid ovary; follicles continuous, falcate, 3–4.5 dm. long; seeds about 2 cm. long, the pale tawny coma twice as long.

Loreto: Iquitos, *Tessmann 5106*, type.

Prestonia mollis HBK. Nov. Gen. & Sp. 3: 221. 1819; 306. *P. glabrata* HBK. l.c. 222, fide Woodson. *P. Weberbaueri* Mgf. Notizbl. Bot. Gart. Berlin 9: 89. 1924, fide Woodson. *Haemadictyon pallidum* A. DC. Prodr. 8: 427. 1844.

More or less puberulent or glabrate to glabrous especially in age, the rather slender stems conspicuously lenticellate; petioles to 3.5 cm. long; stipules many, dentiform-flagelliform; leaves broadly ovate to oblong-elliptic, obscurely cordate or rounded to subtruncate at base, abruptly short-acuminate to obtuse or rounded at apex, to 1.5 dm. long, a cm. wide, mostly much smaller; flowers pale yellow, 10–many in simple corymbs; pedicels 6–12 mm. long; bracts as calyx lobes, foliaceous, narrowly oblong-lanceolate, acuminate, the former to about 2.5 cm. long, the latter to 2 cm. long; squamellae deltoid, erose to lacerate; corolla salverform, sometimes papillate tube 2.2–3.4 cm. long, 4–5 mm. in diameter at base, the lobes 17–25 cm. long, the appendages at least attaining the orifice, the branches prominent; anthers slightly exserted, rarely glabrescent; ovary ovoid, glabrous, about twice as long as the distinct nectaries; follicles continuous, 1.5–3 dm. long, seeds about 1 cm. long, the yellowish coma 3.5–4 cm. long.—Goodspeed collectors noted flowers as dull brown, more yellow toward throat but attractive; Steyermark noted flowers in Ecuador mostly greenish without, half yellow, half green on lobes within. F.M. Negs. 38794 (*P. glabrata*); 38792.

Cajamarca: Bellavista, Río Marañón, *Weberbauer 6231* (type, *P. Weberbaueri*). Jaén de Bracamoros, *Bonpland*, type.—Amazonas: Balsas, *Weberbauer 4265*. Chachapoyas, *Mathews*.—Cuzco: Echarate, *Goodspeed Exped. 10499* (det. Standley). Ecuador.

Prestonia Phenax Woods. Ann. Mo. Bot. Gard. 23: 314. 1936.

Glabrous, the rather stout stems becoming lenticellate, the corymbose inflorescence of greenish-yellow flowers more or less suffused with purple; stipules many, dentiform; petioles to 2 cm. long; leaves broadly ovate to oblong-elliptic, basally rounded, acuminate or subobtuse, 1–nearly 3 dm. long, 4–14 cm. wide, subcoriaceous, opaque; pedicels a cm. or so long; bracts linear, minute; calyx lobes oblong-elliptic, acute, 12–13 mm. long, membranous or subcoriaceous; squamellae entire or emarginulate; corolla salverform, sometimes papillate, the tube 15–17 mm. long, not constricted above, appendages entirely included, 1–2 mm. long, annulus prominent, the lobes 8–12 mm. long; anthers a little exserted, puberulent-papillate; nectaries free or slightly joined, longer than ovary; follicles continuous, falcate.—With several other plants proposed as species may prove to be a part of *P. annularis* (L. f.) G. Don, typically only in Dutch Guiana but the relatively developed characters and proportionate measurements of flowers may of course be constant; *P. finitima* Woods., 312, Amazonian, may be distinctive by its tapering corolla tube and thin-membranous leaves. Markgraf included the type and the Williams specimen in *P. trifida* (*P. glabrata* Schum. not HBK. which is *P. mollis*), maybe correctly.

Loreto: On the Ucayali, *Tessmann 3046*, type. Yurimaguas, *Williams 4310*. Ecuador; Bolivia.

Prestonia Riedelii (Muell. Arg.) Mgf. Repert. Nov. Sp. 20: 26. 1924; 362. *Haemadictyon Riedelii* Muell. Arg. in Mart. Fl. Bras. 6, pt. 1: 170. 1860.

Stems, leaves beneath, peduncles and pedicels—these 1.5–2 cm. long—of the simple racemes more or less rusty puberulent-tomentulose or glabrate; stipules almost minute, pectinate; petioles about 1–4 cm. long; leaves broadly ovate to elliptic, rounded basally, acute or acuminate, 5–18 cm. long, 3–11 cm. wide, membranous, closely hispidulous-strigillose above to glabrate; flowers often many, probably brownish-red yellow; bracts as calyx lobes herbaceous, the former narrowly ovate-lanceolate, to 3 cm. long or longer, the latter elliptic-lanceolate, acuminate, about 1–2 cm. long, puberulent; squamellae deltoid, entire or nearly; corolla salverform, sparsely puberulent, the tube 13–15 mm. long, appendages reduced, ridge-like, 1.5–3 mm. long, annulus thick or tuberculate, the lobes 11–17 mm. long; anthers entirely included, sparsely puberulous, the auricles very short; nectaries nearly or quite distinct, about as long as the papillate ovary; follicles somewhat articulated, densely hispidulous, 1–2.5 dm. long; seeds 11–13 mm. long, the coma about 2.5 cm. long.—F.M. Neg. 38795.

Ayacucho: Aína, *Killip & Smith 22708*. To Argentina and Brazil.

Prestonia robusta Rusby, Descr. S. Amer. Pl. 91. 1920; 320.

Mature stems lenticellate, glabrous; petioles about 1.5 cm. long; leaves broadly oval to obovate-oval, rounded both ends or apically very abruptly and shortly acuminate, 1–2 dm. long, somewhat more than half as wide, probably sometimes larger, subcoriaceous, opaque, glabrous, the many axillary stipules dentiform; inflorescence corymbose or subumbellate, obscurely compound, with many (10–20, probably more) greenish-white or yellowish flowers, the peduncle (apparently to 6 cm. long), pedicels—these 4–10 mm. long—and calyx lobes more or less puberulent; bracts oval to elliptic, 5 (6) mm. long, somewhat foliaceous or purplish, caducous; calyx lobes oval to broadly oblong-elliptic, acute to acuminate, 1–1.5 cm. long, more or less coriaceous, slightly suffused with purple, the dentiform inner scales truncate or erose; corolla glabrous or faintly papillate, the tube 13–15 mm. long, about 3 mm. across at base, appendages slightly exserted, faucal annulus much thickened, the obovate shortly acuminate lobes reflexed or widely spreading, 8 or 9 mm. long; stamens inserted at about the upper third of tube, anthers 0.5 mm. long, glabrous or essentially; stigma 1.2–1.5 mm. long; nectaries compressed-ovoid, separate or nearly, about equaling the glabrous ovary.—Nearly *P. macroneura* (M. Arg.) Woods., 321, of northern Brazil and near Peru, and this conceivably will be found to include it and the similar *P. rotundifolia* Schum. ex Woodson, 318, of Ecuador. However, as to types, the former is completely glabrous, bracts are persistent, flowers tinged with red, yellow and white while the latter has appendages barely attaining the throat, bracts petalaceous, flowers yellow, seemingly a part of *P. robusta.* Cuatrecasas referred the Peruvian specimen to *P. macroneura;* only flower buds are still available; the characters relied upon could well prove to be variable; Woytkowski described leaves as leathery, paler beneath, flowers whitish-yellow, calyx green, pedicels pale brown.

Loreto: Boqueron Padre Abad, *Woytkowski 34418.* Western Bolivia.

Prestonia tomentosa R. Br. Mem. Wern. Soc. 1: 70. 1811; 347.

Densely and rather pale ferrugineous- or yellowish-tomentose (stems finally glabrate) or -villous, especially the leaves beneath and the subumbellate inflorescences even to the waxy yellow salverform corollas; petioles 3–12 (20) mm. long; stipular appendages pectinate; leaves broadly ovate, rounded or obscurely cordate at base, shortly acuminate, 8–19 cm. long, 5–12 cm. wide, firm-membranous, sparsely rusty hirtellous above, opaque; pedicels 4–10 mm. long; bracts ovate-lanceolate, 8–18 mm. long, slightly foliaceous; calyx lobes oblong- to ovate-elliptic, acute, 10–18 mm. long, foliaceous; squamellae dentiform, minutely or not erose; corolla tube 15–18 mm. long, the appendages barely exserted, the annulus thick or tubercled, the lobes 7–12 mm. long; anthers scarcely exserted, glabrous; ovary puberulent-papillate, the concrescent 5-lobed fleshy nectaries longer; follicles stout, rigid, divaricate, 6–9 cm. long, rusty hispid; seeds 8 or 9 mm. long, the pale coma 3.5 cm. long or longer.—Flower bright yellow, annulus white; indument brown (Woytkowski). F.M. Neg. 22261.

San Martín: Tarapoto, *Ule 6650; Woytkowski 35165* (det. Cuatrecasas); *Klug 3525* (det. Standley, *P. surinamensis*).—Loreto: La Victoria, *Williams 2942* (det. Markgraf, *P. surinamensis*). To Colombia, British Guiana and Paraguay.

Prestonia trifida (Poeppig) Woods. Bull. Torrey Bot. Club 60: 392. 1933; 322. *Haemadictyon trifidum* Poeppig, Nov. Gen. & Sp. 3: 67, *pl. 275*. 1845. *P. Evansii* S. Moore, Trans. Linn. Soc. Bot. ser. 2. 4: 395. 1895, fide Woodson.

Glabrous or the young stems at tip and the corymbose di- or trichotomous inflorescence of yellow flowers puberulent or papillate; lenticels prominent; petioles to 2.5 cm. long; leaves broadly ovate or oval, rounded or obtuse at both ends or abruptly short-acuminate, about 1–3 dm. long, half as wide, more or less coriaceous, slightly or not nitidulous; pedicels 6–18 mm. long; bracts persistent, minute, scarious; calyx lobes oblong-elliptic, acute, 9–15 mm. long, coriaceous, purplish; squamellae deltoid, erose or lacerate; corolla salverform, the tube 15–18 mm. long, appendages slightly exserted, annulus prominent, the lobes 7–10 mm. long; anthers a little exserted, glabrous; nectaries and ovary subequal.—*P. amazonica* (Benth.) Macbr. Field Mus. Bot. 11: 34. 1931, to which *Ule 6796* was early referred, is known, according to Woodson, 326, only from Pará; the type has simple or nearly simple inflorescence, calyx lobes only 5–6 mm. long. *P. macroneura* (M. Arg.) Woods., 321, has dense subumbellate inflorescence and foliaceous persistent bracts.

San Martín: Juanjuí, *Klug 3921* (det. Standley, *P. macroneura*). Tarapoto, *Williams 6049; Ule 6504* (distr. as *P. Evansii* S. Moore); *Ule 6796* (det. Markgraf, *P. amazonica*).—Loreto: Maynas, *Poeppig 2161*, type; *Kuhlmann 21851*. Near Iquitos, *Klug 774; 915*. Boqueron Padre Abad, *Woytkowski 34418* (det. Cuatrecasas, *P. macroneura*). "Puca-yacu" (Williams). Colombia; Brazil.

Prestonia vana Woods. Ann. Mo. Bot. Gard. 23: 323. 1936.

Similar to *P. trifida* but the corymbs lax (pedicels 17–20 mm. long), flowers greenish-yellow flushed with red, bracts 2–3 mm. long, calyx lobes subcoriaceous, herbaceous or a little purplish, corolla tube minutely velutinous and within, at insertion of stamens, softly puberulent, appendages to 4.5 mm. long, conspicuously exserted and anthers densely puberulent.—Referred by Standley to *P. glabrata* Schum.; obviously these distinctions are essentially relative but until the range of variation of characters is known the species is as well defined as many others. Related Amazonian species include *P. plumierifolia* Mgf., 325, and *P. amazonica* (Benth.) Macbr., 326, both with shorter (5–8 mm.) calyx lobes, the former with obovate obtuse leaves, the latter with oval shortly acuminate leaves, simple or obscurely dichotomous inflorescence.

Loreto: Balsapuerto, *Klug 3066*, type.

30. LAUBERTIA A. DC.

Reference: Woodson, Ann. Mo. Bot. Gard. 23: 370–375. 1936.

Much like *Prestonia* but the inflorescence always scorpioid and, especially, the calyx lacking squamellae within. Corolla tube sometimes spirally contorted (not in known Peru species), not appendaged but the throat conspicuously annulate.—Commemorates a Spanish dignitary who wrote on *Cinchona*.

Laubertia Boissierii A. DC. Prodr. 8: 487. 1844; 371.

Lenticels prominent on older glabrate stems, the younger finely rusty hirtellous as the leaves above and the far-extended much divided inflorescence of greenish-purple or reddish flowers; petioles 1–1.5 cm. long; leaves sometimes verticillate, ovate to oblong-lanceolate, rounded or obscurely cordate at base, acute to acuminate, 4–18 cm. long, 1–9 cm. wide, firm-membranous, early sparsely puberulent also beneath; pedicels 8–12 mm. long; bracts as calyx lobes nearly scarious, the former minute, the latter ovate acuminate, 2.5–3 mm. long; corolla greenish-purple, subreniform, puberulent-papillate, the tube 1.5–2 cm. long, the obliquely dolabriform reflexed lobes 1–1.5 cm. long; stamens inserted near orifice of tube, the somewhat exserted anthers glabrous to puberulent; ovary and nectaries subequal; follicles 2.5–4 dm. long; seeds 1–1.5 cm. long, the pale coma nearly twice as long.—F.M. Negs. 26871; 34137; 4488.

Huánuco: Muña, *3902*.—Without locality, *Pavón* in Herb. Boissier (Geneva), type (probably by Tafalla from Guayaquil).—Junín: On river bank, La Merced, *5473*. Ecuador.

CONVOLVULACEAE. Morning Glory Family

Twining, trailing or rarely erect herbs or in Peru often more or less ligneous; usually lianas, sometimes erect shrubs or even trees, not infrequently somewhat lactiferous. Leaves exstipulate, alternate, exceptionally reduced to scales or lacking, the plants then parasitic. Flowers axillary, solitary or several and variously disposed, rarely in a terminal inflorescence. Sepals 5, ordinarily free, imbricate, often accrescent. Corolla sympetalous, regular, 4–5-plaited, slightly lobed or nearly entire, convolute or twisted in bud or rarely imbricate except in *Cuscuta*. Stamens 5, the filaments often dilated and pubescent toward the attachment in corolla tube; anthers 2-celled, introrse. Pollen smooth or spinulose. Ovary 2–3-celled, cells 2-ovuled, or 4–6-celled and cells 1-ovuled, rarely with 2–4 nearly free carpels (*Dichondra*). Style filiform, entire or bifid or styles 2. Stigmas capitate, biglobose or bilobed, ellipsoid, oblong-ovate to linear. Fruit generally capsular, sometimes baccate, or ligneous and indehiscent, the often triquetrous seeds glabrous or pubescent.

The richly varied development of the components of the family has presented a fertile field in which botanists can exploit their particular ideas regarding classification; here, in conformity with the often expressed primary purpose of this work, generic lines have been used that simplify identification for the majority of Peruvian species. Even so, the genera traditionally accepted on the basis of style, stigma and fruit characters are, all species considered, not sharply definable, at least with present knowledge, even with consideration of anatomical characters; cf. the detailed analysis of Hans Hallier, Bot. Jahrb. 16: 453–591. 1892; his conclusions when pertinent are referred to below. Recently Guy Roberty, Candollea 14: 11–60. 1953, has given a generic key, with basic emphasis on stigma development and corolla shape, listing genera accepted, together with remarks and synonyms; an introduction explains his viewpoint and his use of symbols. His conclusions, if anything, point up the continuity of all characters, including corolla forms, but his paper is helpful.

Many morning glories are cultivated for ornament, for example, in Peru, *Jacquemontia unilateralis* (Roem. & Schult.) O'Donell, while some species, as *Ipomoea pubescens* Lam. in Peru supply locally popular laxatives.

The origin of the sweet potato, *Ipomoea Batatas* (L.) Lam., cultivated for its farinaceous tuber-like roots, is discussed in *The Botany of Cook's Voyages*, by Elmer Drew Merrill, Chronica Bot. 14, no. 5/6: 321. 1954, a stimulating and invaluable work that is enjoyable as literature. The author observes that this useful plant may have been African originally and that it was widely distributed throughout the world in pre-Colombian times.

Ovary deeply lobed, the fruit bicarpellate; small-leaved creeping herb often in green mats............................1. *Dichondra.*

Ovary not lobed; fruit not carpellate; aspect never entirely like *Dichondra.*

  Aphyllous usually entirely yellow slender parasitic vines. 13. *Cuscuta.*

  Foliose herbs, vines or lianas, shrubs or trees.

    Low rarely erect herbs or depressed half-shrubs; styles 2, bifid, stigmas long.............................2. *Evolvulus.*

    Low erect diffuse often tufted; styles entire, stigmas globose. 3. *Cressa.*

    Tall or elongate, stems finally often climbing, herbaceous or ligneous; style 1, entire, sometimes bifid, or styles 2 (geminate).

      Vigorous lianas or arborescent, rarely subligneous; leaves more or less coriaceous; fruits indehiscent, finally ligneous; corolla mostly pubescent, often laxly; stigmas free, about as thick as long.

        Flowers large; calyx persisting; stamens included. 4. *Maripa.*

        Flowers almost minute; stamens visible; calyx apparently deciduous..........................5. *Dicranostyles.*

      Various in habit, herbaceous to ligneous, even trees, often slender; leaves rarely fleshy or subcoriaceous; corolla glabrous or indument in bands, sparse or rarely dense, appressed, but plants herbaceous or only subligneous; fruit capsular, dehiscent except in *Turbina;* stigmas little if at all longer than thick (except *Convolvulus*) or stigmas complanate (*Jacquemontia*).

        Fruit indehiscent, 1-seeded; flowers several, funnelform; sepals much accrescent, chartaceous; slender glabrous liana; stigmas globose..................6. *Turbina.*

        Fruit capsular, transversely dehiscent, rather fragile; seeds 4 or fewer; corollas as sepals little longer than broad, latter accrescent around fruit; stems (Peru) ribbed or alate........................9. *Operculina.*

Fruit as above but rather valvately dehiscent (atypic, indehiscent); corollas rarely not clearly longer than broad, or sepals, if accrescent, not closely; stems terete or striate.

Stigmas not at all or somewhat longer than broad, and complanate, free or nearly; bracts rarely foliaceous (*Jacquemontia lactescens, J. tamnifolia*).

Style 1, entire or bifid or styles 2; outer sepals much larger than inner, tomentose or finally pellucid; lianas.

Sepals firm, tomentose; corolla tube obvious; style parted (–2), stigmas globose......7. *Bonamia.*

Sepals membranous, finally pellucid, glabrous; corolla tube short; style partly connate, stigmas pulvinate........................8. *Prevostea.*

Style 1 but indument or sepal characters or both not entirely as above or rarely similar, then plants herbaceous (*Ipomoea uniflora*).

Stigmas capitate, entire, 2–3-globular or lobulate; flowers 1–many, rarely congested.

Calyx closely enclosing apically dehiscent capsule; corolla little longer than broad.
9. *Operculina.*

Calyx if accrescent laxly so, fruit if dehiscent valvate; corolla somewhat longer than broad.

Fruit firm, indehiscent, 1-seeded; very slender liana........................6. *Turbina.*

Fruit capsular, valvate, seeds 4 or fewer; herbaceous vines, or, if lianas, rather stout, or shrubs or trees.............10. *Ipomoea.*

Stigmas ellipsoid or oblong and more or less complanate unless *J. nodiflora* where linear but with compact inflorescences as usually except (Peru) *J. floribunda* (shrub); bracts foliose (*J. tamnifolia, J. lactescens*)..........11. *Jacquemontia.*

Stigmas usually and clearly longer than thick or rarely ovate but not complanate, bracts then conspicuous.
12. *Convolvulus.*

1. DICHONDRA Forst.

Perennial herb, the slender prostrate and creeping canescent stems rooting freely, the small flowers solitary in bractless peduncles in the axils of usually green entire reniform leaves. Calyx and corolla deeply parted, the latter with lobes imbricate in bud. Stamens short, styles 2. Ovary strongly 2-lobed, the fruit at maturity consisting of 2 1-seeded utricles which sometimes dehisce irregularly.—A popular ground cover in warmer regions, instead of grass, as for lawns.

Dichondra repens Forst. Char. Gen. 39. *pl. 20.* 1776.

Stems canescently pubescent; leaves usually tomentose or sericeous beneath, glabrous above, 1–3 cm. wide or considerably larger, the long petioles biappendaged at base, longer than peduncles; calyx submembranous, 4–5 mm. long, about equaled by the purple or white-edged corolla; ovary densely white pubescent, the styles basally united. —Variable vegetatively, especially in leaf and by pubescence. Several names proposed for such variations, as var. *peruviana* Poir. Encycl. Suppl. 2: 470. 1812 (var. *sericeus* (Sw.) Choisy in DC. Prodr. 9: 451. 1845), leaves sericeous beneath; var. *occidentalis* (House) Jeps. Fl. Calif. 3, pt. 1: 117. 1939, leaves glabrous or nearly; var. *carolinensis* (Michx.) Choisy, l.c., leaves concolor, calyx villous.

Ancash: Above Puerto Samanco, *Weberbauer*, 167.—Lima: Chancay, *Ruiz & Pavón.* Matucana, *246.*—Huánuco: Chasqui, *3304.* Mito, *1748.*—Junín: Near Tarma, *Ruiz & Pavón; 1068.*—Ayacucho: Aína, *Killip & Smith 23124.*—Cuzco: Valle del Urubamba, Hacienda Urco, *Herrera* (and *Vargas*) *3125.*—Arequipa: Near Cachendo and Mejía, (*Guenther & Buchtien 166; 166a*). Rocky places, Prov. Camana, *Worth & Morrison 15693,* and east of Islay, *15716* (both det. Johnston). "Frutilla del monte." Tropics.

2. EVOLVULUS L.

Reference: S. J. van Ooststroom, Meded. Bot. Mus. Rijksuniv. Utrecht 14: 1–267. 1934.

Prostrate-ascending to erect but non-twining herbs or half-shrubs with usually small often canescent leaves and axillary flowers in cymes or aggregated in terminal spikes. Flower parts 5, the sepals commonly equal length, the rotate or funnelform corolla 5-toothed or subentire. Pollen smooth. Ovary 2-celled (rarely 1-celled), 4-ovuled. Styles 2, free, each parted, the stigmas linear. Disk cupulate or obsolete. Capsule 2–4-valved, 2 (1)-celled, with 4 or fewer glabrous seeds.

Descriptions as determinations mostly after the monographer.

Peduncles obsolete or few mm. long in fruit; flowers solitary, a few in leaf-axils, sometimes crowded in uppermost.
  Stems prostrate-ascending, annual, herbaceous or lignescent at base.
    Annual, rarely persisting; leaves about oblong, usually at least three times longer than wide . . . . *E. simplex.*
    Perennial; leaves often only twice longer than wide or suborbicular.
      Leaves distichous or secund, often longer than wide.
        Flowers sessile or short-pedicellate . . . . *E. holosericeus.*
        Flowers shortly pedunculate and pedicellate . . . *E. incanus.*
      Leaves not distichous, shortly petioled, often nearly as wide as long . . . . *E. nummularius.*
  Stems erect or bushy with ascending branches, ligneous unless above . . . . *E. peruvianus, E. Weberbaueri.*
Peduncles more or less developed but prominent.
  Peduncles, at least most of them, as long as the leaves or longer.
    Corolla about 3–7 mm. across; leaves (3) 5–10 mm. wide; stems filiform . . . . *E. alsinoides.*
    Corolla 8–16 mm. across; stems stouter than filiform.
      Indument, at least predominately, appressed sericeous.
        Leaves glabrous or nearly above; corolla 8–10 mm. across. *E. glaber.*
        Leaves sericeous or tomentose both sides; corolla 12–16 mm. across.
          Indument closely appressed . . . . *E. Herrerae.*
          Indument rather spreading and tomentose . . *E. piurensis.*
      Indument, especially of stems, spreading, villous. *E. Fieldii, E. villosus.*
  Peduncles or at least most of them, shorter than or scarcely longer than leaves.
    Prostrate-ascending from stout woody base.
      Leaves rather villous, elliptic, longer than wide . . . *E. lanatus.*
      Leaves sericeous, ovate, little longer than wide . . . *E. incanus.*

Leaves sericeous, oblong-lanceolate, longer than wide.
E. argyreus.

Erect shrub, to several dm. tall.
E. magnus, E. peruvianus, E. Weberbaueri.

Evolvulus alsinoides L. Sp. Pl. ed. 2. 392. 1762; 26. *Convolvulus alsinoides* L. Sp. Pl. 157. 1753.

Perennial, the first year stems erect with few if any branches, later several prostrate-ascending from lignescent base, appressed- and spreading-pilose, the latter trichomes long, brown or grayish; internodes to 2.5 cm. long; leaves lanceolate or oblong-lanceolate, acute or obtuse, mucronulate, 1–3 cm. long, 2–10 mm. wide, long-pilose on both sides; peduncles slender, usually longer than leaves, sometimes nearly 4 cm. long, 1–few-flowered; bractlets linear, 1–2 mm. long; pedicels appressed pilose, 5–9 mm. long; sepals lanceolate, acuminate, 2–3 mm. long, spreading pilose; corolla rotate, in type a few mm. across.—This (after van Ooststroom, 33) is var. *debilis* (HBK.) van Ooststr. (*E. debilis* HBK. Nov. Gen. & Sp. 3: 115. 1819); the typical form of Asia has somewhat wider leaves, the indument more villous; as in the species the filaments are 2–3 times longer than the anthers, the globose capsule with 4 (or fewer) smooth black seeds. *E. filipes* Mart. is not clearly distinct from *E. debilis*, at least as interpreted by the monographer: in any case, the Peruvian plant has shorter pubescent sepals and ascending instead of reflexed fruiting pedicels, as described for *E. filipes*, which also, at least typically, has more acute leaves; flowers were lacking in the Colombian type of *E. debilis*. F.M. Neg. 13792 (*E. debilis*).

Piura: Serrán, *Weberbauer 5983* (det. van Ooststroom, *E. filipes* Mart.). Bolivia to Mexico (the variety; species widely distributed).

Evolvulus argyreus Choisy, Mém. Soc. Phys. Genève 8: 75. 1837; 80.

Lignescent, densely appressed sericeous even including the sepals, but the several prostrate rather slender stems glabrescent in age, to 3.5 dm. long; leaves distichous or secund, oblong-lanceolate to linear, rounded at base or attenuate to short petiole, shortly acuminate to subacute and mucronulate, 6–20 mm. long, 2–6.5 mm. wide; nerves prominent beneath, the lower pair basal or nearly, long-ascending; peduncles persisting from near base of stems, rigid, suberect, 3–14 mm. long, 1–3-flowered; pedicels to 1 cm. long, reflexed in fruit; sepals lanceolate, acuminate, 2.5–3.5 mm. long, margined trichomes slightly spreading; corolla rotate, bright blue with white bands, 12 mm. across; filaments as much as 1.5 times as long as the linear anthers; ovary globose, glabrous, the 2–4-valved capsule with as many as 4 dark brown seeds.—After van Ooststroom. Perhaps, at least as to Peru, actually a part of *E. incanus; Weberbauer 5498* suggests *E. Herrerae.*

Cajamarca: Ninabamba to Santa Cruz, Prov. Hualgayoc, 2,000 meters, *Weberbauer 4113,* 189. Camino Magdalena, *Raimondi.*—Huánuco: Tournaiquichua below Ambo, *2433.*—Ayacucho: Near Ayacucho, 3,000 meters, *Weberbauer 5498.*—Cuzco: Hacienda Araypallpa, Prov. Paruro, 3,100 meters, *Vargas 444* (det. Standley). To Bolivia; Colombia; West Indies.

Evolvulus Fieldii van Ooststr. Meded. Bot. Mus. Rijksuniv. Utrecht 14: 78. 1934.

Decumbent, the basally lignescent stems to 6 dm. long, appressed short-pilose and patently villous, later glabrous; petioles 1–2 mm. long; leaves oblong-elliptic or -lanceolate to almost ovate, rounded or acutish at base, subacute or obtuse and then mucronulate at apex, mostly 2.5–4.5 cm. long, about 1–1.5 (2) cm. wide, shortly appressed pilose on both sides, midrib and long-ascending lateral as tertiary moderately visible beneath; peduncles filiform, shorter than or surpassing leaves, pubescent as stems, few- to many-flowered, the sublinear or linear-lanceolate bractlets acutely acuminate, (4.5) 6–9 mm. long; filiform pedicels much longer than sepals, these slightly unequal, narrowly lanceolate, acuminate with spreading tips, 5–6 mm. long, patently villous; corolla rotate, blue, to 12 mm. across; filaments 1.5 times longer than the linear anthers; ovary globose-ovoid, glabrous.—After author (as other descriptions at least in large part), who distinguishes it from *E. glaber* Spreng. primarily by the larger bractlets; it is, too, more pubescent, particularly the sepals but, as suggested by my assistant, Henry Paul Jackson, it also resembles *E. villosus* R. & P. and these vegetative differences could be ecological.

Tumbez: Deciduous bushwood, mountains east of Hacienda Chicama, 400–500 meters, *Weberbauer 7670,* type.

Evolvulus glaber Spreng. Syst. 1: 862. 1825; 95.

Stems several, prostrate or ascending, sometimes erect, glabrescent at lignescent base, to several dm. long, more or less pilose, the trichomes closely appressed; petioles short; leaves ovate-obovate, elliptic or oblong, less frequently lanceolate or suborbicular, rounded, truncate or subcordate at base, obtuse or slightly emarginate, mucronulate, sparsely appressed pilose beneath, at least on nerves, few if any trichomes above, about 1–2.5 (4.5) cm. long, 0.5–1.5 (3) cm. wide; peduncles 8–30 mm. long, shorter or longer than subtending leaves, filiform, appressed pilose, 1–3-flowered (rarely more); pedicels 2–4 mm. long, often reflexed in fruit; bractlets linear-subulate, 1.5–3 mm. long; sepals oblong-lanceolate, acute or acuminate, 2.5–3.5 (4) mm. long, ciliate and sparsely pilose, 3-nerved and reticulate-veined; corolla pale blue or white, rotate or funnelform, superficially lobed, 8–10 mm. across, sericeous-banded without; filaments 2–3 times as long as the linear-oblong anthers; ovary glabrous; seeds brown.—The straight appressed indument is a variance to that of the simulating *E. nummularius* (van Ooststroom).

Tumbez: Ricaplaya to Casa Blanqueada, *Weberbauer 7736*. Paraguay to Mexico and the West Indies; southeastern United States.

Evolvulus Herrerae van Ooststr. Meded. Bot. Mus. Rijksuniv. Utrecht 14: 77. 1934.

Probably a perennial, with ascending stems, these in type to 4 dm. long, slender, covered with long pale lustrous soft trichomes, appressed and spreading; leaves lanceolate, rounded at base, acute, 12–20 mm. long, 3–5 (7) mm. wide, sericeous on both sides, the midrib and 1–2 pairs of lateral long-ascending nerves rather prominent beneath; peduncles exceeding leaves, filiform, 1.5–3 cm. long, straight, shortly sericeous, 1–few-flowered, the first branches, if any, about 5 mm. long; pedicels early erect and 2–3 mm. long, finally to 8 mm. long and reflexed; sepals narrowly oblong-lanceolate, acuminate, 3–4 mm. long, appressed-sericeous and long-ciliate; corolla blue, rotate, about 12 mm. across, with sparsely pilose bands without; filaments 1–1.5 times as long as anthers; ovary ovoid, glabrous.—Type, in United States National Herbarium, not seen but presumably the following collections, the indument obscurely spreading, referred by Standley to the somewhat similar *E. alsinoides* L., belong here. Apparently some collections are too near *E. argyreus*, with which this species may be found to merge.

La Libertad: Brushy slope, 3,250 meters, *West 8106*.—Huánuco: Hillside along Río Acomayo, *Woytkowski 34004*.—Apurímac: Sandy loam along Río Pampas below Río Chincheros, *Stork & Horton 10789*.—Cuzco: Apurímac Valley, (*Herrera 3081*, type). Rocky clay slopes of the Apurímac in Acomayo and Parmo provinces, *Vargas 9734*. Bolivia.

Evolvulus holosericeus HBK. Nov. Gen. & Sp. 3: 116. 1819; 131. *E. sericeus* Swartz, var. *holosericeus* (HBK.) van Ooststr. Meded. Bot. Mus. Rijksuniv. Utrecht 14: 130. 1934.

Stems prostrate, lignescent at base, simple or branched, 1–3 dm. long, appressed sericeous-villous or -lanate with more or less spreading trichomes; petioles obsolete or short; leaves distichous, often almost at right angles to stems, variously oblong-lanceolate or ovate-elliptic, rounded or subacute at base, usually acute and mucronate with a fascicle of trichomes at apex, mostly 8–15 mm. long, 2.5–7 mm. wide, typically glabrous above, pubescent as stems beneath or on both sides; flowers solitary, shortly or not pedicellate; bractlets subulate, 2–3 (4.5) mm. long; sepals oblong-lanceolate, acuminate, 3–5 mm. long, sericeous-villous, often spreading and oblique at tip; corolla twice as long, white or blue- or violet-tinted, rotate to broadly funnelform, 7–12 mm. across; filaments inserted 2 mm. from the base; capsule glabrous, the 4 seeds brown or black.—After van Ooststroom, whose disposition of the plant as a variety of the widely distributed *E. sericeus* is no doubt correct monographically, but since the latter in typical form (stems and leaves erect or nearly) is unknown in Peru it is expedient floristically to regard the HBK. plant as distinct, especially since its character is defined within a large area.

Piura: Valley of the Río Huancabamba, *Weberbauer 6283*.—San Martín: Tarapoto, *Ule 6479; Spruce 4043; Williams 5436; 5790; 6162.* Argentina to Mexico.

Evolvulus incanus Pers. Syn. 1: 288. 1805; 91. *E. sericeus* R. & P. Fl. Peruv. 3: 30, *pl. 252.* 1802, fide van Ooststroom.

Prostrate rather fulvous sericeous villous (even to sepals) perennial, the several stems becoming glabrate toward the often leafless bases, sometimes about 3 dm. long; petioles to 1 mm. long; leaves ovate, rounded or slightly cordate at base, acute and mucronulate, 7–14 mm. long, 4–8 mm. wide, indistinctly veined; upper internodes 3–4 mm. long; peduncles obsolete, to 4 (8) mm. long, 1–2-flowered; bractlets linear-subulate, 1.5–2 mm. long; pedicels 4 mm. long; sepals lanceolate, acuminate, 4 mm. long; corolla blue, sericeous-banded without, 12 mm. across; filaments 2–3 times as long as the linear-sagittate anthers; ovary glabrous; seeds 4, brown (Ruíz & Pavón).

Huánuco: Near Huánuco, *Ruíz & Pavón*, type; *Dombey;* rocky or stony slopes, *2049; 3244.*

Evolvulus lanatus Helwig, Notizbl. Bot. Gart. Berlin 10: 107. 1927; 85. *E. helianthemoides* Meissn. var. *lanatus* (Helwig) van Ooststr. Meded. Bot. Mus. Rijksuniv. Utrecht 14: 85. 1934.

Subappressed villous-lanate sericeous to the bases of the more or less ligneous prostrate stems, these 1–2 mm. thick, to 1.5 dm. long; leaves subsessile, longer than the internodes, oblong- or obovate-elliptic, subobtuse, 7–15 mm. long, 3–8 mm. wide; peduncles shorter than the leaves; pedicels to 1 cm. long or longer in fruit and strongly recurved, finally usually somewhat longer than the subtending leaf; sepals lanceolate, acuminate, about 4 mm. long; corolla bright blue, broadly funnelform, 8–10 mm. long; capsule glabrous, little shorter than the sepals.—Perhaps scarcely more than a short-peduncled local variety of *E. villosus,* but with the facies of *E. incanus.*

Arequipa: Lomas, Port of Chola, *Weberbauer 3184,* type. Mollendo, *Johnston 3548* (det. van Ooststroom, *E. villosus*). Atiquipa, *Worth & Morrison 15644* (det. Johnston, *E. argyreus*).

Evolvulus magnus Helwig, Notizbl. Bot. Gart. Berlin 10: 105. 1927; 79.

Erect shrub sometimes about 5 dm. tall, the several stems with a number of suberect branches, the younger parts including the pedicels densely and shortly appressed sericeous-tomentose; internodes 4–5 mm. long; leaves oblong, subobtuse at base, obtuse but mucronulate at apex, 10–14 mm. long, 2.5–4 mm. wide, usually exceeding the straight suberect peduncles; bractlets subulate, 1–1.5 mm. long, persistent; pedicels finally arcuate, to 1 cm. long; sepals lanceolate, acuminate, shortly villous, 3.5–5 mm. long; corolla blue, rotate, about 9 mm. long, presumably 10–12 mm. across, the petals pilose medially without; filaments twice as long as the linear anthers; ovary subglobose, glabrous; seeds as many as 4, dark brown.—Compared by the author, no doubt rightly, to his *E. peruvianus* and *E. Weberbaueri* and separated primarily on the basis of the somewhat longer peduncles; otherwise, many develop a second flower; in all probability these similar plants will be found to form one somewhat variable specific entity. F.M. Neg. 13732.

Cajamarca: In open formations below Santa Cruz, Prov. Hualgayoc, 1,300–2,000 meters, (*Weberbauer 4125,* type).

Evolvulus nummularius L. Sp. Pl. ed. 2. 391. 1762; 114.

Prostrate perennial herb, the several stems becoming lignescent at base, 1–several dm. long, pilose with short spreading curved trichomes, glabrescent; leaves distichous; petioles grooved above, 1–5 (–12) mm. long; leaves broadly ovate, elliptic or orbicular, even obovate or oblong, rounded, truncate or subcordate at the sometimes oblique base, usually 4–15 mm. long, 3–15 mm. wide, or to 2.5 cm. long, 18 mm. wide, glabrous or sparsely appressed pilose especially on the nerves beneath, sometimes also above, now and then ciliate, mostly toward the base; lateral nerves 2–5 pairs, more or less distinct beneath; flowers 1–2 in the axils on the stems or on short lateral branches; peduncles obsolete or very short, at least in Peru; pedicels usually 2–6 mm. long, recurved in fruit; bractlets linear or lanceolate, acute, 0.5–1.5 mm. long; sepals ovate-oblong, obtuse or subacute, mucronulate, microscopically pellucid-dotted, pilose or glabrous except the ciliate margin, reticulate-veined, often reflexed in fruit; corolla white, rarely pale blue, rotate to broadly funnelform, 5–7 mm. long, about 8 mm. across, the 5 distinct lobes sparsely pilose-banded; filaments 2–3 times as long as the oblong anthers; ovary glabrous, globose; seeds brown.—After van Ooststroom, as elsewhere.

San Martín: Tarapoto, *Ule 6880; Spruce 4487*. Mexico to Argentina; West Indies; tropical Africa; India.

Evolvulus peruvianus Helwig, Notizbl. Bot. Gart. Berlin 10: 104. 1927; 188.

Similar to *E. Weberbaueri* but a shrub to 1 meter tall, the branches densely short-tomentose, the older gray bark glabrous; petioles to 1 mm. long; leaves linear-lanceolate or -oblong, acute at base, 1–2 (2.5) cm. long, 3–4 (5) mm. wide, reduced above, densely short-tomentose on both sides, the lateral nerves partly visible; flowers few or several, approximate at end of branches; peduncles none or very short; bractlets subulate; sepals densely villous, linear-lanceolate, acuminate, 5–6 mm. long; filaments one and a half times as long as the linear-sagittate anthers.—Ovary globose, glabrous, according to van Ooststroom, who distinguished this species from *Weberbaueri* on the basis of the glabrous ovary and sericeous sepals; actually the latter ex char. and from negative are spreading villous; type evidently a vigorous well-developed individual and just commencing to flower, which accounts for the density of leaves and flowers and shorter pedicels, upon which character the author himself based his proposed species, remarking "very near *E. Weberbaueri;*" almost certainly there is only one genetic species. F.M. Neg. 13735.

Amazonas: Near Tupén, 800 meters, (*Weberbauer 4799*, type). Without locality, (*Lobb 305*).

Evolvulus piurensis van Ooststr. Meded. Bot. Mus. Rijksuniv. Utrecht 14: 82. 1934.

Prostrate-ascending, to a meter high, densely grayish to fulvous tomentose with a few longer patent trichomes especially on the lower stems; leaves secund, 1–1.5 cm. distant, narrowly oblong to lanceolate- or elliptic-oblong, attenuate to base, acute or subobtuse and mucronulate at apex, 14–22 mm. long, 5–10 mm. wide, the upper about 1 cm. long, 2.5–3 mm. wide, the 3–4 pairs of nerves rather prominent beneath; peduncles at least as long as leaves, filiform, 1–several-flowered; bractlets subulate-linear, approximate, the primary ones 3–4 mm. long; pedicels 5–10 mm. long; sepals lanceolate, acuminate, 3–4 mm. long, short-villous to tomentose; corolla bright blue, sericeous-banded without, about 12 mm. across; filaments twice as long as the linear-oblong anthers; ovary globose, glabrous.—A Haenke specimen is less densely pilose, the leaves lanceolate (author); it probably is from Huánuco; entire plant sericeous-pubescent (Svenson).

Piura: Paita, Pariñas Valley, *Haught 78*, type. Cerro Viento, Nigritos, *Haught 17*. Quebrado, Mogollan, Amotape Hills, (*Haught & Svenson 11645*, det. Svenson).

Evolvulus simplex Andersson, Eugenies Resa Bot. 211. 1855; 121.

Erect single or branched annual (or rarely persisting), the terete brownish or grayish villous stems to 2 dm. high; leaves shortly petioled or subsessile, linear-oblong to oblanceolate, more or less attenuate to base, acute or subobtuse, appressed short-villous, 1–2 (3) cm. long, 2–5 (10) mm. wide; midrib prominent beneath but nerves rather obscure; flowers solitary or 2–3 in the axils from base of stem to tip, the peduncle obsolete or short; pedicels as ciliate calyx villous, 1–2.5 mm. long; bractlets and sepals linear, subacute, 5–7 mm. long; corolla white or bluish-tinged, tubular to funnelform, 2.5–4 mm. long, sparsely sericeous; filaments 4 times as long as the ovoid anthers; capsule glabrous, much shorter than the calyx; seeds dark brown, smooth, 1.5 mm. long.

Tumbez: Zorritos, *Weberbauer 7742*.—Piura: Base of Cerro Prieto, (*Haught & Svenson 11552*). Toblazo, *Haught 144; 218*. Serrán, *Weberbauer 5980*. East of La Brea, *Horton 26059* (det. Johnston).—Cajamarca: Cascas, *Raimondi 7577*. Ecuador; Galapagos.

Evolvulus villosus R. & P. Fl. Peruv. 3: 30, *pl. 253.* 1802; 85. *E. helianthemoides* Meissn. in Mart. Fl. Bras. 7: 345. 1869. *E. villosus* R. & P. var. *lanceolatus* Poir. in Lam. Encycl. Suppl. 3: 459. 1814.

Prostrate-ascending villous-tomentose perennial, the simple or slightly branched stems often glabrescent (as leaves) in age, to 3 or 4 dm. long; leaves commonly secund, the petioles sometimes 1.5 mm. long, elliptic to oblong (rarely subrotund), rounded or subacute at base, obtuse or subacute at apex, (5) 12–24 (10) mm. long, (2) 5–7 (6) mm. wide; lateral nerves 4–5 pairs, more or less obvious; peduncles ordinarily longer than leaves, pubescent or glabrous, 1–2 (3) -flowered, the erect flowering pedicels 5–7 mm. long, reflexed and to 1.5 cm. long in fruit; bractlets linear-subulate, to 3.5 mm. long; sepals equal, narrowly lanceolate, acuminate, (3) 4–6 mm. long or longer, short- or long-villous; corolla blue with 5 lighter bands (sericeous without), rotate or broadly funnelform, to 16 mm. in diameter; filaments as long as the linear sagittate anthers; ovary glabrous; seeds black.—The monographer regarded Meissner's plant as distinct on the basis of its smaller leaves (as indicated in parentheses above) and longer spreading villosity on the sepals; the type, as observed by me, matches that of Ruíz and Pavón, allowing for any ecological variation; however, *Weberbauer 6284* could be recognized as a variety or form with subrotund leaves.

Piura: Huancabamba, 1,700 meters, *Weberbauer 6284* (det. van Ooststroom, *E. helianthemoides*).—Lima: Lomas of Lurín, *Mathews 1247* (type, *E. helianthemoides*); *Raimondi 12589.* Surco, *Ruíz & Pavón*, type; *5923.* Atocongo, *West 3612; Mexia 04040* (det. Johnston); *Pennell 14787.*—Arequipa: Mollendo, *Johnston 3548;* (*Guenther & Buchtein 165; Weberbauer 1555,* det. Helwig). Chile?

Evolvulus Weberbaueri Helwig, Notizbl. Bot. Gart. Berlin 10: 104. 1927; 187.

Stems 1–3, ligneous and glabrate below, erect, strict or branched near apex, 4–6 dm. high, densely appressed sericeous-tomentose as the ascending leaves, these narrowly oblong or linear-lanceolate, often slightly falcate, rounded or subacute at base, acute and mucronulate, 12–20 mm. long, 2–3 mm. wide, gradually reduced above, those subtending the approximate flowers—solitary (–2) in the upper axils—4–8 mm. long; peduncles obsolete or as long as subtending leaves in flower, in age to 4 mm. long; pedicels filiform, in fruit 5–8 mm. long, strongly and becoming arcuately recurved, the indument appressed and spreading; bractlets setaceous, acute, 1–2 mm. long; sepals lanceolate, acuminate, 4–4.5 mm. long, densely villous with broadly spreading trichomes; corolla blue, funnelform, about 7 mm. long, the shortly lobed limb to 1 cm. across, the 5 medial areas long-sericeous without; filaments twice as long as the linear-oblong anthers; ovary glabrous, ovoid, the 4-seeded capsule slightly included.—According to van Ooststroom the ovary is pubescent, the capsule glabrate; indument in any case very obscure, if visible, with a hand lens.

Cajamarca: Grasslands between Tabaconas and Marañón rivers, 1,000 meters, *Weberbauer 6237*, type. Shumba Valley to Jaén, 700 meters, *Weberbauer 6187*.

3. CRESSA L.

Canescent perennial herb with erect, diffuse, procumbent or tufted and basally branched stems, the small white flowers sessile or short-pedicelled in the axils of the subsessile upper leaves, thus appearing capitately or spicately (Peru) congested. Corolla hidden in the chartaceous calyx, the limb 5-parted, the glabrous subulate filaments basally connate, exserted. Ovary 2-celled, 4-ovuled. Styles 2, distinct, equal, the stigmas capitate-globose. Capsule 2-celled, finally 4-valved, often 1-seeded.

Cressa truxillensis HBK. Nov. Gen. & Sp. 3: 119. 1819. *C. cretica* L. var. *truxillensis* (HBK.) Choisy, DC. Prodr. 9: 440. 1845. *C. australis* R. Br. Prodr. 490. 1810.

Stems elongating, procumbent or diffuse, branching, cinereous-sericeous as entire plant; leaves approximate, sessile, oblong, acute at base, subobtuse, 4–6 mm. long, 2–3 mm. wide; flowers axillary, solitary; peduncles 2–4 mm. long; calyx deeply parted, the obovate-elliptic obtuse segments subconcave, subcoriaceous, equal, longer than the basal lanceolate obtuse bracts; corolla white, scarcely equaling the calyx, the ovate divisions acute; ovary pilose, style glabrous; capsules subglobose, calyx persisting, seeds 4.—Near *C. cretica* L. (Kunth, from whom the description is compiled).

C. cretica L. of the Mediterranean region has sessile flowers rather capitately congested at ends of branchlets, ovate leaves sessile by a broad base, mostly 4 mm. long (Jepson, Fl. Calif. 3, pt. 1: 126. 1939), but species variable according to Choisy, l.c., while Hallier f. (Bot. Jahrb. 16: 532. 1893) thought that the Peruvian plant could be distinct. Indeed, there seem to be intermediate forms so that Choisy's disposition of the Andean plant may express more accurately if not so conveniently the taxonomic status. A white-leaved procumbent plant of saline places (Svenson, as to adjacent Ecuador collections; Amer. Journ. Bot. 33: 473. 1946).

La Libertad: Trujillo, *Bonpland,* type.—Lima: Near Lima, *Durville,* (Herb. Vienna, type *C. australis*); *Gaudichaud.*—Ica: Pisco, *Weberbauer 148.*—Arequipa: Mollendo, *Weberbauer 148.* Argentina and Chile to Ecuador; southwestern United States?

4. **MARIPA** Aublet

Lianas, apparently when unsupported becoming trees, with ample, ovate or elliptic coriaceous glabrous leaves and sericeous velutinous flowers in axillary or terminal panicles or racemes. Sepals often coriaceous. Corolla tubular, funnelform or campanulate, 5-lobed, -toothed or subentire. Stamens commonly included, usually glandular at base. Pollen smooth. Disk annular or cupulate. Ovary 2-celled, 4-ovuled, the single style with biglobular or peltate stigma. Fruit large, dry, coriaceous to ligneous, often apiculate, basally enclosed by the appressed sepals, the 1–4 seeds glabrous.—The species as proposed seem to be very tenuous from herbarium material; a revision is much in order; Hallier (Bot. Jahrb. 16: 525. 1893) gave a key based on anatomy to the seven known species.

Inflorescence all axillary, to about 4 cm. long.
  Bracts minute or caducous.
    Corolla deeply lobed, the lobes free.............*M. axilliflora.*
    Corolla lobes joined membranously............*M. fasciculata.*
  Bracts lanceolate, persisting, 2–3 mm. long......*M. Kuhlmannii.*
Inflorescence terminal or in part axillary, usually or mostly longer than 4 cm.
  Flowers 1–2 cm. long.
    Inner sepals not wider than long, ciliate........*M. Williamsii.*
    Inner sepals wider than long, sericeous.............*M. tenuis.*
  Flowers 2.5–3.5 cm. long.
    Leaves rounded, emarginate...................*M. peruviana.*
    Leaves subacute to acuminate.....................*M. glabra.*

Maripa axilliflora Mart. ex Meissn. in Mart. Fl. Bras. 7: 208. 1869.

Glabrous or essentially except the villosulous sepal margins and the yellowish-puberulent corolla lobes without; petioles scarcely sulcate, 2.5– nearly 4 cm. long; leaves oblong, acute at base, obtuse or shortly acuminate, about 1–1.7 dm. long, 5–7.5 cm. wide, thin-coriaceous, concolor, nitidulous, the nerves rather conspicuous above, very prominent beneath, the many veins extremely fine; racemes axillary, the slender, miliaceous puberulent rachis 2.5–3.7 cm. long, the peduncle 6–8 mm. long, in fruit incrassate, 12–16 mm. long, bracts and bractlets not seen in type; sepals nearly 6 mm. long, equal, suborbicular, subcoriaceous; corolla campanulate, about 12 mm. long, deeply lobed, the lobes ovate-oblong, subobtuse, subequaled by the stamens, these tomentulose and broadly dilated; style attaining the anthers, the stigma subdisciform-capitate; fruit ellipsoid, 2.5 cm. long, the appressed calyx not enlarged, the seed about 18 mm. long.—*Klug 1074* has filiform bractlets about 2 mm. long. Illustrated, Meissner, l.c. *pl. 73, fig. 2* (flowers and fruit). F.M. Neg. 31894.

San Martín: Tarapoto, *Spruce 4230*, type. Juanjuí, *Klug 4227* (det. Standley, *M. glabra*).—Loreto: Mishuyacu, near Iquitos, *Klug 1074* (det. van Ooststroom).

Maripa fasciculata van Ooststr. Recueil Trav. Bot. Néerl. 30: 195. 1933.

Robust branching liana, glabrous except for the slightly puberulent leaf-nerves beneath and the minutely granulate-resinous and more or less ciliolate many-flowered inflorescences, the white tubular-funnelform corollas densely sericeous except for the basal portion and the membranous areas between the 6 mm. long lobes; petioles 3.5 cm. long, rugulose, narrowly sulcate; leaves elliptic, acute at base, shortly acuminate, about 1.5–1.7 dm. long, 8–9 cm. wide, chartaceous, opaque both sides, only the 9–11 strict or somewhat arcuate nerves prominent beneath; basal branches of inflorescence 1–1.5 cm. long; pedicels 3.5 mm. long; bracts triangular, 1 mm. long; sepals subcoriaceous, subequal, 4 mm. long, the outer ovate, apically rounded, resinous and ciliolate as sometimes the ovate-orbicular inner; corolla 22 mm. long; filaments inserted 5 mm. above base, filiform, about 8.5 mm. long, basally glandular pilose; anthers linear, 4 mm. long; ovary glabrous, style about 16 mm. long, stigmas globose.—Inflorescence axillary or perhaps from defoliate branches, short and contracted as in *M. axilliflora* Mart., but that species has longer corolla lobes not united by membranes (author).

Loreto: Mishuyacu, near Iquitos, *Klug 314*, type.

Maripa glabra Choisy in DC. Prodr. 9: 327. 1845.

Glabrous except the (typically) appressed pilose inner sepals and the lanuginose corolla; branches terete, slender, hollow; petioles 1.5–

2 cm. long; leaves oblong-elliptic or somewhat ovate, rounded at base or barely acute at petiole, shortly acuminate or acute, often about 1–1.5 dm. long, 5–7 cm. wide; panicles typically leafy below, peduncles 2–4-flowered; bracts small, concave, more or less persisting; pedicels to 1 cm. long, stout; sepals equal, ovate-rounded or suborbicular, coriaceous, 4–5 mm. long, the outer little if at all pilose; corolla funnelform, 1.5–2 (3) cm. long, the lobes acute; capsule oblong, apiculate, 2.5 cm. long, to 1.5 cm. thick, 1-celled, 1-seeded.

Loreto: Mishuyacu, near Iquitos, *Klug 72; 562; 590; 809* (all det. van Ooststroom). Río Mazán, *José Schunke 21* (det. Standley). French Guiana.

Maripa Kuhlmannii (Hoehne) Ducke, Notizbl. Bot. Gart. Berlin 11: 589. 1932. *Dicranostyles Kuhlmannii* Hoehne, Anex. Mem. Inst. Butantan 1, fasc. 6: 46. 1922.

Shrub scarcely climbing, with subangulate glabrous branches, the younger parts, as inflorescence, sparsely ferrugineous-puncticulate, the older paler; petioles about 2 cm. long; leaves drying dark above, lustrous, paler beneath, rounded or slightly attenuate at base, acutely acuminate, 1–1.5 dm. long, 4–5 cm. wide; inflorescence simple or few-branched below, 2–4 cm. long, sometimes glabrous, bracts narrowly lanceolate or linear, persisting, 2–3 mm. long, often ciliate as sepals, these suborbicular, 4 mm. long; petals 6 mm. long, ferrugineous sericeous; filaments pilose only below; style typically bifid (Hoehne) but flowers not opened in type from Matto Grosso.—Differs from *D. scandens* Benth. in being little scandent, nearly glabrous (author); nearly related to the highly variable *M. reticulata* Ducke, Archiv. Jard. Bot. Rio Jan. 3: 248. 1922, and perhaps only a form, but leaves more or less lanceolate-oblong, acute at both ends and with much fewer reticulate veins; fully opened flowers are the same, the style quite entire (Ducke, after Iquitos spec.).

Loreto: Iquitos, (*Kuhlmann 22499,* fide Ducke). Matto Grosso, Brazil.

Maripa peruviana van Ooststr. Recueil Trav. Bot. Néerl. 30: 197. 1933.

Glabrous except for the resinous punctate or granulate branches toward tip and the few–8-flowered subumbellate terminal and axillary inflorescences; petioles 6–10 mm. long; leaves ovate-oblong or oblong, broadly rounded or subtruncate at base, often gradually attenuate to the slightly emarginate apex, 4–8.5 cm. long, 3–4.5 cm. wide, subcoriaceous, minutely black-puncticulate beneath, the 8–11 lateral nerves rather prominent only beneath as also the densely reticulate venation; peduncles 3.5–5 cm. long, shortly cymose-branched, the granulose pedicels 4–6 mm. long; buds ovoid-oblong (flowers unknown); sepals suborbicular, ciliolate, outer 6–6.5 mm. long, inner 7 mm. long; fruit oblong-ellipsoid, about 2.5 cm. long, 13 mm. thick, sepals laxly appressed, the seed 13.5 mm. long, 8.5 mm. broad.—After author, from fruiting type; with apparently some reservation he describes the flowers as follows from *Klug 914:* corolla lilac, narrowly funnelform, 3.5 cm. long, densely appressed sericeous, sparsely resinous-granular toward base or glabrous as the membranes between the lobes, these acute, 14 or 15 mm. long; filaments 7 mm. above base, 12 mm. long, basally dilated and pilose glandular, anthers linear, 6 mm. long; ovary narrow, style filiform, 19 mm. long, stigma globose.—Probably nearest *M. nicaraguensis* Hemsl. with corolla abruptly narrowed into a short tube (author); simulates if not similar to *M. glabra;* the Woytkowski specimen seems ambiguous.

San Martín: Chazuta, *Klug 4066* (det. Standley, *M. glabra*).—Loreto: Mishuyacu, near Iquitos, *Klug 914* (type, flowers); *Klug 2527* (det. Standley, *M. glabra*). Palta-cocha on the upper Río Nanay, *Williams 3199* (type, fruit). Boqueron Padre Abad, *Woytkowski 34416?* Florida, *Klug 2197*. "Nucnu huasca," "mococo-o."

Maripa tenuis Ducke, Archiv. Jard. Bot. Rio Jan. 3: 249. 1922.

High-climbing liana, the terete older branches glabrous, the younger compressed and somewhat tomentulose; petioles 1–2 cm. long; leaves oblong, acute at base, rather shortly acuminate, subcoriaceous, glabrous, slenderly nervose and venulose; panicle terminal, much shorter than the leaves, often subcorymbose with lateral few-flowered pseudo-racemes at the upper leaf-nodes (leaves sometimes fallen), their branchlets 3–5-flowered; sepals suborbicular, subequal, the outer glabrous except the ciliate-villous margins, the inner appressed sericeo-villous as the campanulate white corolla without, this deeply 5-parted, about 16 mm. long; fruit finally long-subconic-elliptic, about 2 cm. long, half as thick.—Near *M. paniculata* Barb. Rodr. Vellosia ed. 2, 3: *pl. 16.* 1891, with more coriaceous leaves and stronger long-peduncled inflorescence with whitish pubescent branches (Ducke); the Tessmann collection not seen recently.

Loreto: Mouth of Río Santiago, *Tessmann 4440* (det. Helwig). Amazonian Brazil.

Maripa Williamsii van Ooststr. Recueil Trav. Bot. Néerl. 30: 196. 1933.

Quite glabrous liana except for the corollas and the minutely resinous-puncticulate 1–few-flowered inflorescences; petioles 6–11 (–20) mm. long, sulcate, rugulose; leaves elliptic or more or less oblong- or ovate-elliptic, obtuse, contracted or somewhat cuneate at base, acute or abruptly short-acuminate, 6–10 (–16) cm. long, 3–5 (–7) cm. wide, chartaceous or subcoriaceous, lustrous above, opaque beneath, the 7–9 (11) ascending lateral nerves prominent beneath, rather so above as the fine dense reticulate veins on both sides; inflorescence terminal, or from the axils of finally deciduous upper leaves, the peduncles 6–15 mm. long, pedicels 2–3 mm. long; bracts rather ovate, acute, 1–2 (2.5) mm. long; sepals subcoriaceous, all ciliolate, about 4.5 mm. long, the outer broadly ovate, obtuse, the inner orbicular; corollas tubular or narrowly funnelform, about 18 mm. long, glabrous below as also the membranes connecting the lobes, these 3.5–4 mm. long; filaments inserted 4 mm. above the base, 5 mm. long, basally short-pilose; anthers linear, 4 mm. long; ovary cylindric, style about 14 mm. long, stigma biglobose; fruit 15 or 16 mm. long, 13 mm. in diameter, the sepals spreading, the seed 10.5 mm. long, 8 mm. broad.—Habit of *M. glabra* Choisy but distinct by the fine venation, especially notable above, and by the sepals, the inner not broader than long as in *M. glabra* and also in the related *M. tenuis* Ducke and *M. paniculata* Barb. Rodr. (author).

San Martín: Tarapoto, *Williams 6621* (fruiting type).—Loreto: Yurimaguas, *Williams 3935*, type; *4023; 4524; 4710.*

5. DICRANOSTYLES Benth.

Much resembles *Maripa;* flowers inconspicuous, in compound lateral panicles; bracts minute; filaments recurving at apex, dilated at base, glandular puberulent; disk cupulate; style more or less bifid to entire, the stigmas biglobose to capitate; ovary glabrous, 2-celled.—This has the completely indehiscent fruit of *Maripa* but is distinguishable by the small flowers with exserted stamens; fruit of *D. scandens* Benth. differs from that of *Maripa* in the absence of calyx, the presence of endosperm in the seeds (Ducke); when first known the fruit was supposed to be capsular, 2-celled.

Kuhlmanniella L. Barroso, which Ducke (Trop. Woods 90: 28. 1947) referred to this genus, was proposed on the basis of the entire style with capitate stigma; the author was apparently unaware of the variation in style and stigma character in the family, often used as the basis of its taxonomy, so quite naturally regarded his plant as generically distinct; it honors Dr. João Geraldo Kuhlmann, a director of the Botanic Garden at Rio de Janeiro and the name may meritoriously be used to indicate at least a section or subgenus; in Rodriguesia 10, no. 21: 21–24. 1947, Barroso replied to Ducke's conclusion.

Leaves glabrous, suboblong.
  Styles fused, stigma capitate; leaves acutely acuminate.
    Pedicels obsolete; calyx sericeous . . . . *D. Mildbraediana.*
    Pedicels elongate; calyx subglabrous . . . . *D. holostyla.*
  Style bifid; leaves obtusely acuminate . . . . *D. scandens.*
Leaves minutely sericeous beneath, elliptic . . . . *D. sericea.*

Dicranostyles holostyla Ducke, Archiv. Jard. Bot. Rio Jan. 4: 169. 1925. *Kuhlmanniella holostyla* (Ducke) L. Barroso, Rodriguesia 10, no. 21: 22. 1947.

Leaves lanceolate, mucronulate, submembranous, sparsely appressed puberulent beneath; lateral nerves 15–20 pairs and with smaller alternate ones, all more prominent beneath; rachis of panicle and especially the pedicels somewhat longer than those of *D. scandens,* these more slender, more cinereous-pubescent; calyx sparsely pubescent or subglabrous, white-ciliate; corolla not lobed below the middle, the divisions very densely white-sericeous without; styles completely connate into one (Ducke).—No doubt will be found in adjacent Peru.

Río Acre: Río Macauhán, *Krukoff 5796.* Amazonian Brazil.

Dicranostyles Mildbraediana Pilger, Notizbl. Bot. Gart. Berlin 9: 1150. 1927. *Kuhlmanniella Mildbraediana* (Pilger) L. Barroso, Rodriguesia 10, no. 21: 23. 1947, fide Ducke.

High climbing liana (or tree?), glabrous except the short densely flowered panicles; petioles rather slender, to 2 cm. long; leaves drying fragile, oval, triangularly narrowed toward base, shortly narrowed toward apex and abruptly subcaudate-acuminate (acumen 1–1.5 cm. long), 10–13 cm. long, 3–4 cm. wide, midrib narrowly impressed above, prominent beneath as the slender lateral nerves, these about 12, ascending, arcuately joined near the margin; rachis, branchlets, bracts and sepals rigidly short-pilose; bracts ovate-lanceolate, about 1 mm. long, the flowers also very small; calyx subglobose, about 2 mm. long; sepals subcoriaceous, rotund, the outer concave, little broader than long; corolla tube turbinate, not at all exserted, the lobes connivent, slightly incurved, narrowly ovate, 1.5 mm. long, shortly pilosulous toward apex; ovary 4-ovuled; style rather stout, 0.5 mm. long, the apically flat somewhat pear-shaped stigma scarcely 0.5 mm. long; anthers broad, truncate, introrse, the filament scarcely longer than 1 mm., high-inserted.—As *D. holostyla* Ducke, Archiv. Jard. Bot. Rio Jan. 4: 169. 1925 (and at least one other species), the stigmas are fused, thus capitate; there are short glandular trichomes but no scales within the corolla (author). To 20 meters high, the stem to 6 cm. thick (collector); tree, 12 meters tall (Klug). Mildbraed, scholarly student particularly of African flora, was a modest gentleman, generous with his time and knowledge. F.M. Neg. 13745.

Loreto: Flood-free wood, *Tessmann 4069,* type. Balsapuerto, *Klug 2947* (det. Standley).

Dicranostyles scandens Benth. in Hook. Lond. Journ. Bot. 5: 355. 1846.

High climbing liana, glabrous except the puberulent-tomentulose younger terete slender branches, panicles and the appressed pubescent corolla lobes without; petioles 1–1.5 cm. long; leaves oblong, acute at base, subabruptly acuminate (acumen obtuse, 12 mm. long), somewhat lustrous above, subrigid, 8–12 cm. long, 2.5–3.5 cm. wide, the pinnate nerves rather prominent beneath, the veins visible or obscure; panicles racemiform, lax, 2.5–5 cm. long, the branches 1–3-flowered; pedicels scarcely as long as calyx; bracts scab-like; corolla tube glabrous, the lobes oblong, not mucronulate; calyx scarcely 2 mm. long, sepals equal, orbicular stems inserted medially but as long as corolla; filaments glandular at base.—Fruit ellipsoid, glabrous, about 2.5 cm. long, 1.5 cm. thick, calyx partly persisting (*Krukoff 5728*). *D. densa* Spruce has short dense panicles, the leaves fulvous-sericeous-tomentulose beneath. Illustrated, Mart. Fl. Bras. 7: *pl. 118, fig. 1.*

Río Acre: Mouth of Río Macauhán, *Krukoff 5301; 5728* (det. A. C. Smith). To the Guianas.

Dicranostyles sericea Gleason, Amer. Journ. Bot. 19: 751. 1932.

Liana with glabrous subterete branches; petioles minutely pubescent, 1.5–2 cm. long; leaves oblong-elliptic, broadly acute at base, abruptly narrowed and acuminate (acumen 1–2 cm. long), 11–14 cm. long, 5–6 cm. wide, firm, glabrous above, thinly fulvous-sericeous beneath, veins impressed above, secondaries about 12 pairs, the tertiaries reticulate beneath; racemes axillary, 3–6 in the upper axils, 3–5 cm. long, fulvous-sericeous including the calyx and corolla limb without; flowers subsessile, bracts minute, ovate; sepals coriaceous, rotund, obtuse, 1.5 mm. long; corolla campanulate, 4 mm. long, the tube glabrous, 1.3 mm. long, lobed to below the middle; stamens on the corolla tube; filaments nearly 2 mm. long, densely glandular hirtellous below the middle; anthers cordate-ovate; style subentire, the stigmas subglobose.—*D. holostyla* Ducke, probably from Peru (at least Río Acre), differs in its narrowly mucronulate leaves whitish beneath, long pedicels, subglabrous calyx and corolla lobed only above the middle; *D. Mildbraediana* Pilger has glabrous leaves, pilose inflorescence, smaller and merely pilose corolla (author); *D. densa* Spruce has leaves sericeous beneath, but, as to type at least, crowded inflorescence. Illustrated, van Ooststroom, Recueil Trav. Bot. Néerl. 30: 194, *fig. 1*.

Loreto: Mishuyacu, near Iquitos, *Klug 1132*, type. Balsapuerto, *Klug 2962* (det. Standley).

6. TURBINA Raf.

Often subligneous vines or lianas with several- to many-flowered inflorescences, in Peru on leafy axillary branchlets. Sepals, at least in Peru, not coriaceous, very accrescent in fruit. Corolla showy, tubular to funnelform. Stamens as the single style included, stigmas capitate. Ovary 2-celled, the capsule finally 1-celled, 1-seeded.—van Ooststroom (Blumea 5: 355. 1943) showed that *Rivea* Choisy (Mém. Soc. Phys. Genève 6: 407. 1833) is another plant.

Turbina Raf. is a neighbor of *Ipomoea* L. but differs by its 1-celled, 1-seeded indehiscent fruit; besides the following, *T. abutiloides* (HBK.) O'Donell (Lilloa 23: 505, *pl. 11*. 1950), known from Guayaquil to Colombia and Venezuela, may occur: it is a branched vine, the leaves tomentose beneath, corollas 6–7 cm. long, capsules fusiform, 14–17 mm. long, the puberulent ellipsoid seed about 1 cm. long. F.M. Neg. 38951.

Turbina corymbosa (L.) Raf. Fl. Tell. 4: 81. 1836. *Convolvulus corymbosa* L. Syst. Nat. ed. 10. 293. 1759. *C. sidaefolius* HBK. Nov. Gen. & Sp. 3: 99. 1819? *Ipomoea corymbosa* (L.) Roth, Nov. Pl. Sp. 109. 1821. *Rivea corymbosa* (L.) Hall. f. Bot. Jahrb. 18: 157. 1893. *Legendrea corymbosa* (L.) van Ooststr. Blumea 5: 355. 1943.

Glabrous or nearly, the branchlets and inflorescences only sparsely pilosulous; petioles slender, 3–5 cm. long; leaves cordate, ovate, entire, rather abruptly caudate-acuminate, often 8–10 cm. long, 6–7 cm. wide, membranous; inflorescences lax, to a dm. or so long, the slender pedicels about 1 cm. long; sepals oblong-elliptic, mucronate, membranous, 12 mm. long, in age to 1.5 cm. long and chartaceous, persisting; corolla white but often purple or yellow within, about 2.5–3 cm. long; style with biglobular stigmas slightly longer than the stamens, these rather coarsely pubescent toward base; fruit ellipsoid.—Determinations (except noted) by van Ooststroom.

San Martín: Zepelacio, *Klug 3648* (det. Standley).—Junín: La Merced, *5319*. Puerto Bermudez, *Killip & Smith 26620*. Colonia Perené, *Killip & Smith 25419*. Bolivia to Mexico and the West Indies.

7. BONAMIA Thovars

Flowers axillary, solitary or dichasial, rarely in congested terminal panicles, bracts small, lanceolate, sepals various, herbaceous, rarely subequal, never membranous. Corolla medium, funnelform, hirsute without except 5 episepalous nerves; stamens often included, filaments usually glandular-villous; pollen smooth, ovary 2-celled, style 2-parted or styles 2, stigmas biglobose, rarely biparted or 4; capsule 4-valved or 2-, finally 4-valved and ligneous, rarely finally irregularly multi-cleft from apex, chartaceous, 4-seeded, seeds glabrous or rarely marginally or all over pilose (after Hallier f.).

Bonamia peruviana van Ooststr. Recueil Trav. Bot. Néerl. 30: 192. 1933.

Liana, densely and shortly ferrugineous-tomentose even to the outer sepals; petioles 1.5 cm. long; leaves ovate or ovate-elliptic, rounded at base, shortly and acutely acuminate, mucronulate, 5.5–7 cm. long, 3–4 cm. wide, the 7–8 lateral nerves not at all or scarcely impressed above, prominent beneath; cymes few–several-flowered, the peduncles 2–4 cm. long, 1–3 times dichotomously branched, primary branches 1–3 cm. long, slender pedicels 1.5–2 cm. long, sometimes longer; bracts linear-subulate, about 2 mm. long; sepals unequal, the outer 2 broadly ovate, subcordate at base, subobtuse, 8–12 mm. long, 7–10 mm. wide, the glabrous orbicular inner 4–5 mm. long; corolla 22–25 mm. long, the pubescent bands sparsely pilose; stamens 7–8 mm. long, the filaments 6 mm. long, anthers 2.5 mm. long; ovary glabrous, style more than medially and rather unequally parted.—Distinguished from *B. Kuhlmannii* Hoehne, Anex. Mem. Inst. Butantan 1, fasc. 6: 44, *pl. 2.* 1922, of Matto Grosso, Brazil, by the form of the leaves and the smaller calyx, this in Hoehne's species with outer sepals to 2 cm. long (author); the large leaves of the latter, too, are subcordate. These apparent differences, of course, may prove to be due to age and variable in a series of collections.

Loreto: Mishuyacu, near Iquitos, *Klug 232*, type.

8. PREVOSTEA Choisy

Lianas with entire leaves and racemose flowers or these 1–several in the axils. Sepals membranous, glabrous, accrescent and more or less pellucid, the outer much larger, finely reticulate-nervose. Corolla urceolate, subentire, tubular only at base. Stamens included. Ovary 2-celled, the cells 2-ovuled. Styles partly connate (or 2), the stigmas pulvinate-capitate or globose. Capsule 1–2-seeded, fragile.—Like *Bonamia* according to Hallier except for the accrescent membranous sepals; Roberty, from sepal development, allies it to *Turbina* with styles more connate, stigmas globular. *Dufourea* HBK. not Bong. ex Willd.

Prevostea sericea (HBK.) Choisy, Ann. Sci. Nat. sér. 1, 4: 498. 1825. *Dufourea sericea* HBK. Nov. Gen. & Sp. 3: 114, *pl. 214*. 1819.

Liana, the leaves lustrous beneath with a close sericeous indument, glabrous above, elliptic, shortly acute at base, cuspidate-acuminate, often 12–15 cm. long, about half as wide, chartaceous-subcoriaceous, obscurely lustrous and reticulate-veined above; petioles 1–1.5 cm. long; flowers many, in terminal subdichotomous panicles; peduncles and pedicels subappressed strigose, the former several cm. long, the latter in fruit slender, about 1 cm. long or longer; outer sepals in fruit cordate-ovate, rounded at tip, 2 cm. long, 1.5 cm. wide, very papery; corolla white, tube short, limb dentate, sericeous between the plaits; filaments glabrous, as long as the oblong anthers; ovary 2-celled, apically sericeous; stigmas glabrous.—*P. glabra* (HBK.) Choisy differs as indicated by the name and perhaps, as no doubt *P. sericea*, occurs in adjacent Peru as in Madre Dios.

Río Acre: Mouth of Río Macauhán, *Krukoff 5776*. Brazil; Colombia.

9. OPERCULINA Silva Manso

Large-flowered twining herbs or lianas, the stems often angulate or narrowly alate, the broad early scarious sepals more or less coriaceous and enlarged in fruit, then often somewhat erose. Disk, if present, small. Stamens (pollen smooth) as the single style, included or barely exserted, the stigma biglobular. Fruit not valvate but circumscissile above the middle, the upper part falling with the style, the endocarp finally and irregularly splitting. Seeds 4 or fewer, glabrous.—Roberty (Candollea 14: 37. 1952) included this in *Merremia* as a section interpreting the genus, and as distinct from *Ipomoea,* on the basis of irregularity or tardiness in capsule dehiscence or in any case calyx enclosing capsule. Actually *Operculina* is probably merely an extreme state of *Ipomoea* sens. lat. (including *Merremia*) but a convenient segregate, and, technically, Manso's name may belong to *I. dissecta* (*I. tuberosa*).

Corolla 9 cm., white and lilac........................*O. codonantha.*
Corolla smaller, yellow or reddish.
  Stems angled; corolla yellow-red....................*O. pteripes.*
  Stems alate; corolla yellow.........................*O. triquetra.*

Operculina codonantha (Benth.) Hall. f. Bot. Jahrb. 16: 550. 1893. *Ipomoea codonantha* Benth. Pl. Hartw. 120. 1843.

Glabrous; leaves cordate, acuminate, 3–5-angled at base or sinuate-lobed, the stout elongate 1-flowered peduncles bracted at apex; leaves 10–12 cm. long, varying in width; pedicels incrassate; sepals nearly 2.5 cm. long, very obtuse, the larger outer ones orbicular; corolla white, the obscure lobes mucronulate, buds densely pilose; anthers spiralled (after Bentham).—This species has sepals rather obovate, 3 cm. long, corolla 9 cm. long, lobate, white and lilac, peduncles long-pilose.

San Martín: Juanjuí, *Klug 4308* (det. Standley with query). Ecuador.

Operculina pteripes (Don) O'Donell, Lilloa 23: 435, *pl. 6.* 1950. *Calonyction pteripes* G. Don, Gen. Syst. 4: 264. 1838. *O. pteropus* Meissn. in Mart. Fl. Bras. 7: 214. 1869, fide Hallier. *Ipomoea alatipes* Hook. Bot. Mag. 88: *pl. 5330.* 1862, fide Hallier. *O. alatipes* (Hook.) House, Bull. Torrey Club 33: 499. 1906.

Branches angled, to 5 mm. thick; petioles 1–8 cm. long, glabrous or slightly pubescent above; leaves ovate or ovate-lanceolate, 3–13 cm. long, 2–8 cm. wide, cordate or subtruncate at base, acute to acuminate, mucronate, glabrous or somewhat pubescent on the prominent nerves beneath; cymes (1) 2–12-flowered; peduncles 2–15 cm. long, often alate medially; bractlets lanceolate, about 1 cm. long; pedicels incrassate above, 1.5–3.5 cm. long; sepals ovate to subelliptic, nearly equal, obtuse or subacute, 2.2–2.6 cm. long, 1.5 to about 2 cm. broad, rounded or the outer truncate at base; corolla salverform, red-orange or -salmon, 4–7 cm. long, tube 0.5–1 cm. wide, in part tomentulose without; stamens 4–5 cm. long, anthers 7–8 mm. long; ovary ovoid, attenuate to the style, this 3–4 cm. long; capsule ellipsoid, operculate, surrounded by the sepals, the pedicels clavate.—After O'Donell, who does not distinguish this from *O. alata* (Ham.) Urban (i.e. *O. triquetra*), which compare.

Peru (probably). To Mexico and Venezuela.

Operculina triquetra (Vahl) Macbr., comb. nov. *Convolvulus triqueter* Vahl, Symb. Bot. 3: 30. 1793. *O. alata* (Ham.) Urban, Symb. Ant. 3: 343. 1902. *C. alatus* Ham. Prodr. Fl. Ind. Occ. 24. 1825. *Ipomoea triquetra* (Vahl) Roem. & Schult. Syst. 4: 231. 1819. *I. altissima* Mart. ex Choisy in DC. Prodr. 9: 359. 1845. *Merremia triquetra* (Vahl) G. Rob. Candollea 14: 36. 1952.

Stems, peduncles above and often the pedicels more or less alate; sepals 2.5–3.5 cm. long; corolla yellow, broadly campanulate, 3.5–5 cm. long.—Otherwise apparently like *O. pteripes*.

San Martín: Juanjuí, *Klug 4335* (det. Standley). West Indies; tropical South America.

10. IPOMOEA L.

Merremia Dennst. Schluess. Hort. Malab. 34. 1818. *Calonyction* Choisy, Mém. Soc. Phys. Genève 6: 441. 1833. *Aniseia* Choisy, l.c. 8: 65. 1838.

Herbaceous to ligneous, widely various vegetatively and in habit. Sepals sometimes accrescent in fruit. Corolla funnelform-campanulate, infrequently salverform. Pollen more or less spinulose or smooth, variously striate and shaped. Stigma capitate, entire, 2–3-globular or lobulate. Capsules 4–6-valved, irregularly dehiscent (exceptionally indehiscent), seeds 4–6 or fewer.

Some authorities, as van Ooststroom, have limited this genus to include only species with spinulose pollen; O'Donell not (as evidenced by *I. longistaminea* O'Donell, Lilloa 23: 488. 1950); species with smooth ellipsoid pollen are associated with different characters of fruit and style in all other accepted genera; therefore, there seems to be no reason to regard species otherwise characteristic as constituting a group (i.e. *Merremia*) distinct from the other Ipomoeas which they all resemble (except for smooth pollen) even in their diversity of habit, and, unless for the pollen, in characters of stigma and fruit. Apparently this was Standley's opinion (Field Mus. Bot. 12: 331. 1936). Nevertheless O'Donell (Lilloa 5: 35. 1939), while including, as cited above, species with smooth or spinulose pollen, accepted the conclusion of Hallier (Bot. Jahrb. 16: 581–582. 1893) that *Merremia* is clearly distinguishable from *Ipomoea* by its espinulose pollen and its pores, which are not distributed regularly on the entire surface; the grains actually are varyingly ellipsoidal, granulose and always in diameter more than 50 microns (O'Donell) as sometimes in *Convolvulus.* Otto Kunze (Rev. Gen. 3: 209–211. 1899) questioned the constancy of the pollen character and the uniformity of its development, and disclaimed its significance, a conclusion accepted by Roberty (Candollea 14: 19. 1952). Certainly in a family in which the lines of development and therefore relationship intercept as closely as here a single character can scarcely be used by itself as a key to sorting out the various entities or groups; a similar situation is found in Gentianaceae. Likewise *Aniseia* is easily associated here rather than with the otherwise more dissimilar species grouped together in *Convolvulus* or *Jacquemontia,* from which Hallier particularly distinguished it on its simple pubescence; this is variable as other anatomical characters in all groups.

My indebtedness to the late O'Donell (l.c. 5: 35–64. 1939, and 6: 467–554. 1941) for a revision of the American species of *Merremia* is acknowledged gratefully; van Ooststroom's revision of the species of Malay (Blumea 3: 292–360. 1939) has also been helpful. It is noteworthy that no distinctive generic description of *Merremia* seems to have been proposed, even by these recent students. The application of some specific names used in this compilation may be open to question but synonymy given will clear the identity. Some species described under the name *Merremia* are so retained both in the key (as "*M.*") and in the text to avoid transfer to *Ipomoea,* in courtesy to others. The imperfectly known *I. franciscana* Choisy is of necessity omitted from the key. And Bruns (Mitt. Inst. Bot. Hamburg 8: 66. 1929) gave a name only to *Guenther & Buchtein 164* from Arequipa, not seen by me.

Corolla more or less broadly funnelform-campanulate; stamens included.

  Flowers large, (3.5) 4–many cm. long, yellow only in *I. Lindenii;* sepals glabrous or nearly except *I. Mathewsiana* (sericeous), *I. Nil, I. purpurea* (hirsute).

Sepals or (outer) scarcely or not longer than wide, usually shorter than 1 cm. or shrubs or trees.

Leaves rounded-reniform, sometimes emarginate.

Trailing or clambering, glabrous or nearly (maybe one species).

Flowers 4–5 cm. long.

Leaves reticulate-veined .... *I. crassifolia.*

Leaves parallel-veined .... *I. Pes-Caprae.*

Flowers to 8 cm. long .... *I. asarifolia.*

Erect shrub or tree; leaves tomentose beneath. *I. pulcherrima.*

Leaves or their segments more or less acuminate or acute.

Leaves entire or broadly lobed.

Sepals (or outer) not suborbicular, glabrous or puberulent, rarely 12 mm. long.

Flowers pilosulous without, cymose .... *I. carnea.*

Flowers glabrous.

Shrubs or trees; flowers white (or partly), 1–3 or few.

Leaves as sepals puberulent without; corolla 7–9 cm. long; tree .... *I. calodendron.*

Leaves as sepals glabrous without; corolla to about 7 cm. long .... *I. Vargasiana.*

Vines, more or less herbaceous; flowers tinted.

Flowers subumbellate, pedicels short. *I. squamosa.*

Flowers cymose, pedicels to 2.5 cm. long. *I. jujuyensis.*

Sepals suborbicular, to 1.5 cm. long, usually ciliate. *I. phillomega.*

Leaves palmately divided .... *I. digitata.*

Sepals (or outer) clearly longer than wide, often longer than 1 cm.; herbaceous or lianas except *I. Mathewsiana, I. Pearceana.*

Leaves entire or if lobed, broadly.

Annual vines, the herbaceous sepals narrowly acuminate or linear.

Sepals sublinear, to 2.5 cm. long, hirsute .... *I. Nil.*

Sepals sublanceolate, rarely 2 cm. long, glabrate to laxly pilose .... *I. purpurea.*

Perennials, more or less herbaceous or lianas or shrubs; sepals acute or obtuse, membranous or firm except *I. setifera.*

Sepals glabrous or nearly; lianas or somewhat herbaceous; leaves rather acute unless *I. setifera.*

Flowers usually 2–many; vines except *I. Batatas.*

Sepals (outer) aristate or acute; flowers not yellow.

Herbaceous or subligneous, usually climbing.

Sepals herbaceous (outer), 1.5–2.5 cm. long.

Sepals aristate-setose, to 1.5 cm. long; stems early pilose.................*I. setifera.*

Sepals glabrous, mucronate, about 22 mm. long; stems glabrous.......*I. peruviana.*

Sepals firm (outer), 4–8 mm. long, inner to 1 cm. long.........................*I. tiliacea.*

Trailing from tuber, nodal rooting, often weedy. *I. Batatas.*

Sepals obtuse; flowers yellow; liana.....*I. Lindenii.*

Flowers solitary (rarely 2); prostrate stout-stemmed perennials or slender vine.

Stems smooth, glabrous, upper 2–3 mm. thick. *I. incarnata.*

Stems muricate or pilose, 4–5 mm. thick.

Stems glabrous; leaves broadly lobed. *M. grandiflora.*

Stems pilose; leaves entire............*I. clavata.*

Sepals appressed sericeous; shrubs; leaves rounded.

Leaves membranous, finely sericeous beneath. *I. Pearceana.*

Leaves subcoriaceous, sericeous tomentose beneath. *I. Mathewsiana.*

Leaves palmately parted or divided.

Divisions usually serrate or cleft, not extending to base. *I. tuberosa.*

Divisions nearly entire.

Leaflets 5, very unequal; corolla 7 cm. long. *M. Weberbaueri.*

Leaflets 3–7, subequal; corolla 3.5–4.5 cm. long. *I. macrocalyx.*

- Flowers 2–3 (3.5) cm. long, yellow, white or rarely roseate, often more or less campanulate.
  - Sepals glabrous or nearly.
    - Leaves palmately divided to base.
      - Leaflets entire; peduncles eglandular....... *I. macrocalyx.*
      - Leaflets serrate; peduncles glandular...... *I. quinquefolia.*
    - Leaves palmately and narrowly parted.......... *I. tuberosa.*
    - Leaves entire, broadly lobed or unevenly cleft (cf. also *I. Lindenii*).
      - Flowers usually many; sepals, at least inner, rounded.
        - Flowers yellow, subumbellate............ *I. polyanthes.*
        - Flowers subpaniculate, white or nearly..... *I. reticulata.*
      - Flowers few–many, white, roseate or violet-blue; sepals oblong-ovate to elliptic.
        - Pedicels often many, subequaling smooth sepals. *I. dichotoma, I. ramosissima.*
        - Pedicels 1–few, often longer than usually rough sepals.
          - Leaves usually entire, 2–many cm. long.
            - Stems and peduncles glabrous or nearly.
              - Sepals not spotted, subscarious; seeds somewhat pubescent.
                - Sepals suboblong, subacute, 4–5 mm. long; corolla tinted.................. *I. Peckoltii.*
                - Sepals elliptic, obtuse, 5–9 mm. long; corolla white...................... *I. piurensis.*
              - Sepals spotted, medially firm; seeds glabrous to puberulous..................... *I. tricolor.*
            - Stems and peduncles long-hirsute...... *I. Velardei.*
          - Leaves crenate to cleft or unevenly narrowly parted. *I. muricata.*
  - Sepals very pubescent.
    - Sepals subequal, spreading hirsute.
      - Leaflets entire; sepals obtuse................ *I. aegyptia.*
      - Leaflets dentate; sepals acuminate.......... *I. cissoides.*
    - Sepals very unequal.
      - Sepals appressed pubescent................. *I. pubescens.*
      - Sepals glabrous, outer decurrent............. *I. uniflora.*

Corolla narrowly tubular-funnelform; stamens slightly exserted, or corolla distinctly salverform.
  Sepals very long-caudate............................*I. alba.*
  Sepals obtuse or awned.
    Leaves entire.
      Corolla 5–8 cm. long, salverform; sepals obtuse...*I. Nationis.*
      Corolla about 2–3 (4) cm. long; sepals awned.
        Corolla 2.5–4 cm. long, limb spreading........*I. coccinea.*
        Corolla to about 2 cm. long, limb suberect....*I. angulata.*
    Leaves pinnately divided.......................*I. Quamoclit.*

Ipomoea aegyptia L. Sp. Pl. 162. 1753. *Convolvulus pentaphyllus* L. Sp. Pl. ed. 2. 223. 1762. *Merremia aegyptia* (L.) Urban, Symb. Ant. 4: 505. 1910.

Terete-stemmed twiner, yellowish spreading-hirsute except the appressed-pilose palmately 5-parted leaves; petioles slender, 2.5–12 cm. long; leaflets subsessile, elliptic, acute at base, acuminate, 2.5–10 cm. long, 1–4 cm. wide; peduncles often several-flowered, 5–many cm. long; bracts deciduous, lanceolate, 2–5 mm. long; pedicels 1–3 cm. long; bud acute; sepals ovate-oblong, acute, the 3 outer 1.5–2 cm. long, the somewhat shorter inner glabrous; corolla white, campanulate-funnelform, glabrous, 2–3 cm. long; filaments basally glandular, the anthers spiralled; pollen angled-ellipsoidal; ovary glabrous, 4-celled, the globose 4-valved capsule with 4 glabrous seeds.—Van Ooststroom (Recueil Trav. Bot. Néerl. 30: 204–206. 1933) gave a key to this group of species and O'Donell (Lilloa 6: 467–554. 1941) a revision as noted under the generic description. Illustrated, Haught (Amer. Journ. Bot. 33: 400, *fig. 3*) and O'Donell (l.c. 5: 58, *fig. 6*).

Piura: River gravels near La Brea, *Horton 11570* (det. Weatherby); (*Haught & Svenson 11613*). Parinas Valley, *Haught 166*. Hacienda Ñomala, *Weberbauer 5958*.—Junín: La Merced, *5282; Killip & Smith 23390* (both det. van Ooststroom).—Cuzco: Río Vilcanata, *Mexia 8048* (det. Standley). Circumtropical but native to warm America.

Ipomoea alba L. Sp. Pl. 161. 1753. *Convolvulus aculeatus* L. l.c. 155. *I. bona-nox* L. Sp. Pl. ed. 2. 228. 1762. *Calonyction aculeatum* (L.) House, Bull. Torrey Club 31: 590. 1904.

Lactiferous twining herb, usually glabrous (even the seeds) or the slender terete stems sometimes softly or rather finely muricate; petioles several to many cm. long; leaves membranous, rarely somewhat pilose, commonly deeply cordate with large entire or angular lobes, ovate or orbicular, about 1–1.5 dm. long, 5–12 cm. wide; peduncles stout, mostly larger than petioles, 1–several-flowered; bracts small, deciduous; pedicels incrassate in fruit; outer sepals 2 or 3, ovate or lanceolate, linear-acuminate, the ovate inner mucronulate; corolla white, greenish-banded, salverform, the narrow tube 7.5–10 cm. long, abruptly expanding into the limb, this 7–15 cm. across; stamens inserted in upper part of tube, shortly exserted with the style; ovary 2-celled; capsule ovoid-oblong, about 3 cm. long including the persisting style base; seeds 4 or fewer, 1 cm. long.—Determinations by van Ooststroom or noted. Illustrated, Choisy (Mém. Soc. Phys. Genève, 6: 441, *pl. 1, fig. 4*), as *C. speciosum* (L. f.) Choisy.

The "Moonflower" of English-speaking gardeners, the beautiful fragrant flowers opening only once, and at night.

San Martín: San Roque, *Williams 7476; 7478.* Río Chumbaza, *Woytkowski 35138* (det. Cuatrecasas).—Lima: Sea cliffs, Chorillos, *Stork 9365* (det. Weatherby).—Huánuco: Along river, Huánuco, *2064.*—Junín: La Merced, *Killip & Smith 23395.* Puerto Yessup, *Killip & Smith 26322.*—Loreto: Iquitos, *Williams 8211* (det. Standley). Boqueron Padre Abad, *Woytkowski 34391* (det. Cuatrecasas). —Ayacucho: Kimpitiriki, Río Apurímac, *Killip & Smith 22852.*—Cuzco: Huadquina, 1,600 meters, Valle del Urubamba, *Herrera 3610.* Generally distributed in the tropics.

Ipomoea angulata Ortega, Decad. 7: 8. 1798. *Quamoclit Ruiziana* G. Don, Gen. Syst. 4: 258. 1838. *I. acutangula* R. & P. Fl. Peruv. 2: 11. 1799.

Apparently similar to *I. coccinea* but often smaller, especially the slender corollas, these at most 2 cm. long, the short limb suberect, the stamens barely exserted; calyx awns minutely papillose.—The rather weedy widely distributed *I. coccinea* seems regularly to have considerably longer flowers with more flaring limb but if this is the only contrasting character the specific status of this coastal native is open to question. The Ruíz & Pavón plate is labeled *I. acuminata,* while the one captioned *I. angulata* represents *I. acutangula* R. & P., which is the same, apparently. Flowers to 2 cm. long, dark red, often on plants only 2 dm. high, stamens scarcely exserted, limb less spreading than in *I. coccinea* but the seeds identical (Svenson, Amer. Journ. Bot. 33: 475, *pl. 17, fig. 2.* 1946). Illustrated, Ruíz & Pavón (Fl. Peruv. 2: 11, *pl. 120, fig. b*), as *I. acuminata.*

Piura: Erect or trailing on rocks, Cerro Prieto, *Haught 130;* (*Haught & Svenson 11510*).—Ancash: Lomas de Monzón, *Goodspeed Exped. 9174.*—Lima: Trailing in rock, *163* (det. van Ooststroom, *I. coccinea*). Amancaës, Chancay, Huará, *Ruiz & Pavón.* Huarochiri, *Goodpseed 11484* (det. Weatherby, *I. coccinea*); *33017.* Chosica, *Horton 10998.* Santa Clara, (*Rose 18621*). Mongomarca, near Lima, (*Weberbauer 5231*). Matucana, erect, later trailing, *2930* (det. van Ooststroom, *I. coccinea*). Prov. Canete, *Vargas 9318.*—Huánuco: Pozuzo and Chinchao, *Ruiz & Pavón* (type, *I. acutangula*).—Junín: La Merced, *5341* (det. van Ooststroom). Chile?

Ipomoea asarifolia (Desr.) Roem. & Schult. Syst. 4: 251. 1819. *Convolvulus asarifolius* Desr. in Lam. Encycl. 3: 562. 1791.

Glabrous, procumbent-ascending with cordate-reniform or suborbicular leaves (petioles to 2 cm. long) and large flowers (5–8 cm. long) with distinctly unequal sepals; leaves usually 2.5–8 cm. long, little broader, palmately 5–7-nerved, the lower nerves approximate, the upper pinnate; peduncles about 2.5 cm. long, pedicels 1.5–2 cm. long, often papillose-asperulous; bracts ovate-oblong, 3 mm. long; outer sepals ovate, half as long as the oblong-ovate inner, these 12–14 mm. long; corolla funnelform, rose-lilac or purple-violet, the filaments at dilated base violet pilose; disk fleshy; seeds black, glabrous. —Perhaps the earlier name for *I. crassifolia,* if that is distinct from *I. Pes-Caprae.* Johnston referred here a Goodspeed Expedition specimen (*9007*) from Piura, but it is in fruit; it resembles other material determined as *I. crassifolia* or *I. Pes-Caprae,* both, ex char., with rather smaller to much smaller flowers. There are several closely related forms, perhaps all variations of one for which the earliest name may be *I. repens* (L.) Lam.

Peru (perhaps; cf. note above). Brazil.

Ipomoea Batatas (L.) Lam. Illustr. 1: 465. 1791. *Convolvulus Batatas* L. Sp. Pl. 154. 1753.

Glabrous or pubescent perennial from tuberous roots, the prostrate-rambling stems rooting at the nodes; leaves variously ovate or subrotund, cordate or truncate at base, mucronulately and obtusely or subacutely angulate, lobed or parted, 5–15 cm. long; peduncles shorter or longer than the elongate slender petioles; pedicels cymose, 7–12 mm. long; sepals subcoriaceous, glabrous, ovate-oblong, acute to acuminate, mucronulate, the outer 7–8, the inner to 12 mm. long; campanulate corolla graduated to narrow base, purple or white, 5 cm.

long; ovary 2-celled, sparsely if at all pubescent; seeds 4, or fewer.—Perhaps native of tropical America, but widely escaped from cultivation, as at Hacienda Schunke and Villcabamba (cf. Merrill, Chronica Bot. 14, no. 5/6: 321. 1954, and elsewhere). Some specimens cited, incomplete or not seen in connection with this account, may belong to *I. peruviana* O'Donell. Earliest illustration, Merrill, l.c., *text fig. 18*, from Hist. Nat. Bras. by Piso & Marcgrave, 1648.

Herrera noted the following native names of races of the sweet potato. (1) "Dulces": "yurac-apichu" (blancos), "puca-apichu" (rojos), "azul-apichu" (azul), all cultivated, and "kusi-apichu" that grows wild in abundance on the lower Urubamba. (2) "Almidonosas": "yurac-cjumara" (blancos), "puca-cjumara" (rojizas), "ccompilliclla" (small purplish napiform tubers), "occe-chchuto," "kusi-cjumara" and "incampamaccasccan" (the deep purple flesh discolors the tongue).

San Martín: San Roque, *Williams 7360*.—Lima: Chancay, *Ruiz & Pavón*.—Huánuco: Villcabamba, Río Chinchao, *5002*.—Junín: Hacienda Schunke near La Merced, *5736*.—Loreto: Near Iquitos, *Klug 732; 880*. Yurimaguas, *Williams 4366; 5018*, and many others. Tropical America. "Apichu," "camote," "cjumara," "batate," "cunal-huasca."

Ipomoea calodendron O'Donell, Lilloa 23: 480, *pl. 9*. 1950.

Tree 4–10 meters high, the smooth greenish-barked trunk to 3 dm. in diameter, the brownish branches 3–6 mm. thick, finely pubescent or glabrescent as the petioles, these 3–10 cm. long; internodes 0.5–5 cm. long; leaves ovate to ovate-oblong, entire or scarcely sinuate, truncate or cordate at the base with rounded auricles, obtuse to long-acuminate, mucronate, 6–22 cm. long, 5–15 cm. wide, glabrous above, pubescent on the prominent nerves beneath or glabrate; flowers solitary in the axils of ovate-lanceolate crowded reduced (2–3.5 by 1–1.5 cm.) leaves on peduncles 1–4 mm. long; bracts caducous; pedicels 2–3.3 cm. long, stout, glabrescent; buds ovoid, glabrous or pubescent at the apex; sepals all elliptic to subovate, obtuse, the outer 11 or 12 mm. long, 7–7.5 mm. wide, dorsally sparsely and shortly pubescent or glabrate, puberulent within, the inner 11 mm. long, 7–8 mm. wide, subcordate at the base; corolla infundibuliform, apically deeply emarginate, glabrous, 7–9 cm. long; stamens 3.5 and 2.6–2.7 cm. long, the filaments basally densely pubescent; anthers 1 cm. long, pollen spinose; ovary glabrous, ovoid, 2-celled, 4-ovuled; style about 2.5 cm. long, stigmas globose; disk annular.—Resembles in Peru the completely glabrous *I. Vargasiana* O'Donell; otherwise resembles species of Mexico and Central America, as *I. arborescens* (H. & B.) G. Don, but more material necessary to determine true relationship (author). *I. fruticosa* O. Ktze. (Rev. Gen. 2: 444. 1891) of Ecuador or Venezuela is described as a liana with sepals only 5 mm. long, leaves green but pubescent beneath; Johnston suggested (in herb.) a relationship with *I. Vargasiana* and therefore here. Sap milky, largest specimens about 10 meters tall; trunk divides into a few larger nearly perpendicular branches but the flowers are produced on more or less pendent twigs 3–6 dm. long but no trace of twining (Haught and A. A. Olsson); flowers 7–10 cm. across, white with dark red throat, opening at night, withering about 9 A.M. (Haught) or violet (Weberbauer).

Tumbez: Tumbez Valley, (*Olsson 60*).—Piura: Valley of the Río Quiros, *Weberbauer 6396*, type. Cerro Viento, *Haught 201*. Talara, *Haught 60a*.

Ipomoea carnea Jacq. Enum. Pl. Carib. 13: 1760.

Shrubby or a liana ordinarily a meter or two high with broadly cordate-ovate acuminate leaves (often 1–1.5 dm. and about as wide) softly pilosulous beneath, and pink or rose-red flowers to 1 dm. long, the limb widely expanded; stems semifleshy above, puberulent as the petioles (upper about 5 cm. long) and several-flowered cymes (including the buds), the inflorescence shorter than the subtending leaves; sepals subequal, suborbicular, 5–6 mm. long; corolla funnelform, medially puberulent-banded; stamens about 2 and 4 cm. long, the anthers 8 mm. long; seeds long-pilose.—Upright, sparingly branched, 1–2 meters high (Diels) or to 5 meters high when clambering and supported; foliage poisonous (Haught). Determinations by van Ooststroom.

Piura: Talara, *Haught 55*. Parinas, Chira and Mancora Valleys, *Haught 95*. Río Quiros Valley, 1,300 meters, *Weberbauer 6356*. To Central America; Venezuela; West Indies. "Borrachero" (Haught).

Ipomoea cissoides (Lam.) Griseb. Fl. Br. W. Indies 473. 1864. *Convolvulus cissoides* Lam. Illustr. 1: 462. 1791. *M. cissoides* (Lam.) Hall. f. Bot. Jahrb. 16: 552. 1893.

Slender-stemmed, more or less pubescent to glabrous, procumbent or twining, often ligneous at base; petioles elongating; leaflets ordinarily glandular beneath, mostly 5, usually elliptic, subpetiolulate, acute at both ends, entire to serrate, not very unequal, the larger medial usually 3–4 cm. long, about 1 cm. wide; peduncles 1–3 cm. long, 1–3- rarely several-flowered; bracts linear, 3–15 mm. long, 1 mm. wide; bud acute; sepals ovate to ovate-lanceolate, narrowly acuminate, sometimes hirsute, often glandular, 1–1.5 cm. long or slightly longer; corolla funnelform, white or roseate, to 3 cm. long; anthers coiled, pollen as in *I. aegyptia;* capsule globose, 3 (–4) -celled, the cells 1-seeded, seeds papillose-puberulent, 4–4.5 mm. long.—After O'Donell, in part (Lilloa 6: 520). A number of forms have been named, mostly referring to variation in indument; also a f. *integrifolia* Meissn. under *Ipomoea* has been found in the adjacent part of Bolivia (van Ooststroom). Illustrated, Mart. Fl. Bras. 7: *pl. 80, fig. 1.* Lilloa, 5: 61, *fig. 7* and *pl. 3* opposite page 60.

Peru (probably). General in South America.

Ipomoea clavata (G. Don) van Ooststr. Field Mus. Bot. 11: 3. 1931. *I. lactescens* Benth. Pl. Hartw. 120. 1843. *Calonyction clavatum* G. Don, Gen. Syst. 4: 264. 1838.

Lactescent, the stems and petioles long-spreading pilose, the glabrous leaves semifleshy, deeply cordate, acuminate, entire or obscurely angled, 8–10 cm. long; peduncles scarcely 6 mm. long; pedicels about 2 cm. long; sepals subequal, oblong, obtuse or the outer subacute, membranous, glabrous, 2 cm. long; corolla blue, violet or white, ample, funnelform; ovary 2-celled, each cell 2-ovuled.—Hallier f. discussed (Bot. Jahrb. 16: 556. 1893) the above synonymy. Flowers white, pale and dark violet (Klug).

San Martín: Chazuta, *Klug 4076* (det. Standley).—Huánuco: Pozuzo, *4671* (det. van Ooststroom); *Ruíz & Pavón,* type.—Junín: La Merced, *5394* (det. van Ooststroom). Ecuador.

Ipomoea coccinea L. Sp. Pl. 160. 1753. *Quamoclit coccinea* (L.) Moench, Meth. 453. 1794.

Annual twining herb, the ovate to orbicular leaves cordate, acuminate, 5–15 cm. long, entire or angulate-lobed, slender-petioled; peduncles few–several-flowered; sepals obtuse but subulate-awned, about 4 mm. long; corolla 2.5–4 cm. long, merely 5-angled or obscurely 5-lobed; stamens somewhat exserted; ovary 4-celled as usually the globose 4-valved capsule, this 6–8 mm. in diameter; seeds partly fulvous sericeous pubescent.—Perhaps this should include *I. angulata* Ortega, a smaller-flowered native of restricted range.

San Martín: Clearing, Chazuta, *Klug 4021* (det. Standley, *I. angulata*). Tarapoto, *William 6021* (det. van Ooststroom, *I. angulata*); *Williams 5472; 5726* (det. Standley, *I. angulata*).—Junín: La Merced, *5341* (det. van Ooststroom, *I. angulata*); *Ochoa 618.*—Cuzco: Hadquina, Valle del Urubamba, *Herrera 3618.* Echarate, *Goodspeed Exped. 10504.* Río Villcanota, *Mexia 8041.* Quillabamba, *West 8002.* Tropical America.

Ipomoea crassifolia Cav. Descr. 100. 1802.

Green or yellowish-green plant including the erect or usually trailing rather thick and fleshy stems; petioles 5–7 cm. long or longer; leaves subreniform, mostly about twice as wide as long, subtruncate or lightly cordate at base, little or not emarginate at the rounded top, those subtending the shorter or little longer cymes often about 8 cm. wide, 5 cm. long; lateral nerves arcuate-ascending, the veins reticulate; pedicels slender, to 1.5 cm. long; sepals broadly oblong- or ovate-elliptic, rounded at tip, the outer about 8 mm. long, mucronulate, the inner about 12 mm. long; corolla white, funnelform-campanulate, 4 cm. long, about 2.5 cm. wide at top.—Resembles *I. Pes-Caprae* (L.) Sweet, with all veins parallel, sepals ovate-lanceolate, corolla 4 cm. long, 6.5 cm. wide, but Meissner reduced this here with query. Trailing in sandy soil back of beach and at least 10 km. inland along water courses (Haught); our collection from which illustration was made rooting at nodes, perhaps due to previous inundation (Svenson). Illustrated, Svenson (Amer. Journ. Bot. 33: 474, *pl. 17, fig. 4*).

Piura: Talara, *Haught 210; Goodspeed Exped. 9007* (det. Johnston, *I. asarifolia*). Parinas Valley, *Haught 177;* (*Haught & Svenson 11513*). Adjacent Ecuador.

Ipomoea dichotoma Choisy in DC. Prodr. 9: 383. 1845.

Glabrous or sparsely pilose, the leaves typically sagittate and 3-lobed, middle lobe ovate, narrowed at base, auricles rounded, 2.5–5 cm. long, the slender petioles 1–3.5 cm. long; peduncles stout, single or bifid, the branches 12–16 mm. long, pedicels 2–6 mm. long, the 5–9 tubular-funnelform white flowers less than or barely 2 cm. long; sepals ovate or obovate-oblong, obtuse or mucronulate, the inner 4–6 mm. long, the outer 2–4 mm. long, subcoriaceous, glabrous; corolla limb little dilated, subentire; stigma biglobose; capsule globose, equaled by the calyx, 2-celled, 4-valved, the 4 seeds glabrous. —The Poeppig specimen is var. *integrifolia* Meissn. (Mart. Fl. Bras. 7: 281. 1869). Ex char. questionably distinct from *I. ramosissima* unless for the smaller flowers. Illustrated, Meissner, l.c. (var. *trilobata* Meissn.).

Peru(?): *Poeppig,* without data. Brazil.

Ipomoea digitata L. Syst. Nat. ed. 10. 924. 1759. *Convolvulus paniculatus* L. Sp. Pl. 156. 1753. *I. paniculata* (L.) R. Br. Prodr. 486. 1810, not Burm. 1768.

Liana, glabrous or sparsely pubescent including the flowers, the leaves palmately divided at least medially, more or less cordate or truncate, the peduncles often about equally long, dichotomously branched, the canaliculate petioles much shorter; leaf-segments 3–7, ovate to oblong-lanceolate, entire, obtusely acuminate, the larger medial 5–8 cm. long, 1–2.5 cm. wide; flower buds globose, much shorter than pedicels, usually pubescent; sepals equal, rounded or orbicular, coriaceous, to 1 cm. long, enclosing the very slender tube of the lilac funnelform corolla, this 4–6 cm. long; ovary glabrous, 2-celled; seeds 4, long-pubescent.—Leaf variations have been given varietal status.

Loreto: Near Iquitos, *Klug 770* (det. van Ooststroom). Tropics generally.

Ipomoea franciscana Choisy in DC. Prodr. 9: 357. 1845.

Ligneous, branched, glabrous; leaves oblong-lanceolate, entire, attenuate to petiole, obtuse, 2.5–5 cm. long, 4–6 mm. wide, approximate on the fruiting branches; fruiting pedicel stout, 1-flowered, 16 mm. long; sepals persisting (marcescent), ovate, obtuse, 6 mm. long; capsule 2-celled; seeds small, long-setose.—Probably in Peru.

Río Acre: Río São Francisco, (*Martius*, type).

Merremia grandiflora van Ooststr. Recueil Trav. Bot. Néerl. 30: 203. 1933; 505.

Suffrutescent, prostrate, with a ligneous subterranean stem in type nearly 1 cm. thick; glabrous, including the 1–2-flowered axillary inflorescence but this as also the fistulose branches (these 2–5 mm. thick) and petioles (1–3.5 cm. long) early minutely, older coarsely, verruculose, each tubercle tipped with a hyaline trichome; leaves truncate, openly cordate or shortly decurrent at base, 2.5–7 cm. long, 2.5–8 cm. wide, the 5 broadly rounded or subemarginate mucronulate lobes subequal, extending a fourth to a third from the coarsely crenate or dentate margin, the basal lobes now and then subbilobate; primary nerves prominent beneath as the distinctly reticulate veins; peduncles 3–7 cm. long; pedicels apically incrassate, smooth, 1–2 cm. long, the deciduous bracts 5 mm. long; sepals membranous, oblong or somewhat ovate, subacute to subemarginate, puncticulate, often subequal, 2–3 cm. long; corolla white, campanulate-funnelform, 6.5–

7.5 cm. long; stamen filaments unequal, puberulent at base, 9–11 mm. long; anthers much contorted; ovary 2-celled, cells 2-ovuled, style 16 mm. long.—Belongs, as *M. Weberbaueri*, to section *Streptandra* Hall. f. (author). Illustrated, van Ooststroom, l.c. 201, *fig. 2*.

Lima: Rock outcrops, San Bartolomé to Puente de Verrugas, 1,500 meters, *Weberbauer 5218*, type. Between Chosica and Matucana, *Goodspeed 11315* (det. Johnston). At km. 60, *Goodspeed & Metcalf 30224*.

Ipomoea incarnata (Vahl) Choisy in DC. Prodr. 9: 360. 1845. *Convolvulus incarnatus* Vahl, Eclog. 2: 12. 1798. *I. linearifolia* Hook. f. Trans. Linn. Soc. 20: 204. 1847. *I. Kinbergi* Anderss. Sv. Vet. Akad. Handl. 212. 1853–55.

Glabrous; petioles 2–7 cm. long; leaves deeply cordate, acuminate, with divaricate acute entire auricles, 3–6 cm. long, 3–5 cm. wide; peduncles 1-flowered, longer than petioles; bracts small, lanceolate; sepals lanceolate, scarious, about 1–2.5 cm. long, glabrous, the inner narrower; corolla pink, campanulate, about 6 cm. long, as wide or wider at top.—Trailing or twining from woody base, the large white flowers with purple bands and center; survives driest habitats (Svenson); stems to 10 meters long (Haught). Determinations by van Ooststroom. Illustrated, Svenson (Amer. Journ. Bot. 33: 474, *pl. 17, fig. 5*).

Piura: Hacienda Ñomala, *Weberbauer 5927*. La Brea, (*Haught & Svenson 11624*). Talara, *Haught 221*. Purinas Valley, *Haught 92*.—Tumbez: Cancas, *Weberbauer 7755*.—Lima: Río Rimac Valley, *Goodspeed Exped. 30214* (det. Leonard); *11507* (det. Johnston). Chosica to Matucana, *Goodspeed Exped. 04091; 11337* (det. Johnston). North and northwest shore South America; Galapagos.

Ipomoea jujuyensis O'Donell, Lilloa 14: 174, *pl. 4*. 1948.

Twining, sometimes decumbent perennial, the branchlets 2–5 mm. thick, sparsely quasi-hispid as petioles (these 2–10 cm. long) with whitish simple retrorse trichomes 0.3–0.7 mm. long; leaves ovate, entire or 3-lobed, rather narrowly and deeply cordate (auricles rounded), acute, acuminate or caudate, mucronate, 4.5–15 cm. long, 3–11 cm. wide, above evenly sparsely and antrorsely appressed pubescent, beneath distinctly so on the nerves, becoming glabrescent as the peduncles (5–16 cm. long) of the (1) 2–5-flowered cymes; bracts and bractlets caducous, ovate-lanceolate, the former 3–3.5 mm. long, the latter 2 mm. long; secondary peduncles 3–10 mm. long; pedicels stout, quasi-hirsute, incrassate and reflexed after anthesis, about 1–2.5 cm. long; sepals scarious-margined, commonly emarginate with small mucro, the outer elliptic, dorsally antrorsely pubescent or glabrate, 6–8 mm. long, 5–6 mm. wide, the inner glabrous, suborbicular, concave, 7–8 mm. long, 8.5–9.5 mm. wide; corolla glabrous, infundibuliform, 5.5–7.5 cm. long, blue, the tube within roseate; buds ovoid, acute; stamens 4.5–5.5 cm. and 4–5 cm. long, filaments slender, long-(and abundantly) glandular pubescent at base, anthers sagittate, 3.5–4 mm. long, pollen spheroid, spinose; ovary glabrous, ovoid, 2-celled, 4-ovuled, style 4.5–5 cm. long, stigmas 2-globose.—Root tuberous; very characteristic by its large blue flowers and very large stamens; a high-mountain species probably also in Bolivia and Peru (author).

Peru (probably). Ecuador; northern Argentina.

Ipomoea Lindenii Mart. & Gal. Bull. Acad. R. Sci. Belg. 12, pt. 2: 264. 1845. *Ipomoea sidaefolia* Choisy fide Seemann, Bot. Voy. Herald 171. 1854.

Smooth, stem suffruticose, climbing; leaves cordate, ovate, acuminate, or upper ovate-lanceolate; peduncle 4–6 mm. long, much longer than pedicels, these shorter than petioles, 1–3-flowered; sepals unequal, oblong, obtuse, scarious-margined; corolla yellow, funnelform-campanulate, sublobate, 2.5–3.5 cm. long; seeds long-pilose.—Flowers yellowish-white in my collections, determined by van Ooststroom. Type from Zacuapan, Mexico, *Galeotti & Linden 301*. Cf. *I. polyanthes* with, apparently, different sepals, usually many funnelform flowers.

San Martín: San Roque, *Williams 7244*.—Huánuco: Pampayacu, Río Chinchao, *5124*. Muña, *3903*.

Ipomoea macrocalyx (R. & P.) Choisy, DC. Prodr. 9: 362. 1845. *I. glabra* (Aublet) Choisy, l.c. *Convolvulus glaber* Aublet, Pl. Guian. 1: 138, *pl. 53*. 1775, not Miller, 1768. *C. macrocalyx* R. & P. Fl. Peruv. 2: 10, *pl. 118*. 1799. *Merremia glabra* (Aublet) Hall. f. Bot. Jahrb. 16: 552. 1893. *M. macrocalyx* (R. & P.) O'Donell, Lilloa 6: 506. 1941.

Usually vigorous more or less ligneous vine, glabrous or rarely more or less appressed pubescent; leaflets 3–5 (7); ovate-oblong or lanceolate, sometimes petiolulate, 5–8 cm. long, 1–2.5 cm. wide; peduncles strongly dichotomous; sepals oblong-lanceolate, obtuse or subacute, subequal, 2 cm. long or longer, especially in front, when chartaceous and often reddish; corolla campanulate-funnelform, white or faintly purplish, or yellowish within, 4–5 cm. long; stamens inserted medially, the filaments hirsute at base, the anthers often twisted; ovary 4-celled; seeds minutely puberulent.—Except as noted, determinations mostly by van Ooststroom who proposed *M. glabra* var. *pubescens* (branches and leaf-nerves beneath more or less pubescent, Field Mus. Bot. 11: 3. 1931) on the basis of my collection. Illustrated, Mart. Fl. Bras. 7. *pl. 104;* Lilloa 5: 55, *fig. 5.*

San Martín: Juanjuí, *Klug 4378,* and San Roque, *Williams 7104; 7651* (all det. Standley).—Huánuco: Cuchero and Chinchao, *Ruiz & Pavón* (type, *C. macrocalyx*). Valley of the Monzón, *Weberbauer 3622,* 286. Pampayacu, *5045* (type, var. *pubescens*). Tingo María, *Stork & Horton 9556* (det. Standley).—Junín: Near San Ramón, *Constance & Tovar 2221.* Chanchamayo Valley, *Schunke 387; 466* (var.). Colonia Perené, *Killip & Smith 24976; 25375.*—Loreto: Yarina Cocha, *Tessmann 5394.* Yurimaguas, *Killip & Smith 28177; Williams 3958.* Río Chino, *Woytkowski 34399.*—Ayacucho: Río Apurímac Valley, *Killip & Smith 22993.* Tropical South America.

Ipomoea Mathewsiana O. Ktze. Rev. Gen. 2: 443. 1891.

Shrub, 1.25 meters high; leaves scarcely 5 cm. long, tomentose beneath, glabrous above; sepals subequal, subscarious, 2–3 cm. long, narrow, densely sericeous without, more or less obtuse.—Contrasted by author with his *I. Pearceana* with lanceolate sepals, leaves sericeous beneath. From a photo by Killip the type suggests *I. pulcherrima* van Ooststr.

Junín: Quebrada Pariahuanca, (*Mathews 855,* type).—Huancavelica: Cerens-Bonifax area toward Mantaro Bridge, Prov. Tayacaja, *Stork & Horton 10407.*

Ipomoea muricata Cav. Icones 5: 52, *pl. 478, fig. 2.* 1799. *I. Plummerae* Gray, Syn. Fl. N. Am. ed. 2. 2, pt. 1: 434. 1886. *I. minuta* R. Fries, Nov. Act. Soc. Sci. Upsala ser. 4, 1: 113. 1905?

Root napiform at base of a slender stem sometimes several cm. beneath the surface; branches to 2 dm. long, decumbent, nearly or quite glabrous as the subrotund to obovate leaves, ordinarily to about 1.5 cm. long or often much smaller, palmately divided to nearly entire, more or less incised apically to merely lobulate or crenate, the divisions variously sublinear or nearly filiform to lanceolate or spatulate; petioles 2–7 mm. long; peduncles about as long as the petioles to little longer than the leaves, 1-flowered, sometimes verruculose as often the sepals, these oblong-lanceolate, acute to obtuse, 4–6 mm. long; corolla funnelform, pink to purple, usually about 2–3 cm. long; capsules globose, the seeds cinereous (Choisy).—The species may prove to be divisible at least into geographical varieties; van Ooststroom (Recueil Trav. Bot. Néerl. 30: 207–211. 1933) proposed the following disposition of the Peruvian leaf-forms under *I. Plummerae:* f. *typica* van Ooststr., leaves palmately 5–7-foliolate, segments linear or spathulate-linear; f. *adiantifolia* van Ooststr., leaves rhomboid-flabellate, basally cuneate, often decumbent, apically broadly rounded, crenate. Var. *cuneifolia* (Gray) van Ooststr. (*I. egregia* House, not *I. cuneifolia* Meissn.) is restricted, according to him, to Arizona. Illustrated, van Ooststroom, l.c. 208, *fig. 3.*

Apurímac: Oropeza Valley, *Vargas 9792.* Chincheros, *Stork & Horton 10759.*—Cuzco: Prov. de Paucartambo, 3,300 meters, *Vargas.* Also Prov. de Cercado, Quebrada de Chocco, 3,450 meters.—Arequipa: Mollendo, *Weberbauer 1561* (f. *adiantifolia*); *1562* (toward f. *typica,* det. Johnston, *I. muricata*).—Puno: Salcedo, *Soukup 485.* Near Puno, *Soukup 238.*—Moquegua: Open mixed formation, 2,700 meters, *Weberbauer 7275a; 7275* (between f. *typica* and f. *adiantifolia*). Argentina to Arizona.

Ipomoea Nationis (Hook.) Nichols. Dict. Gard. 2: 191. 1885. *Quamoclit Nationis* Hook. Bot. Mag. 90: *pl. 5432.* 1864.

Tuberous-rooted, essentially glabrous, the stems sometimes muricate below and greatly elongating; petioles 5–10 cm. long; leaves membranous, cordate, acuminate, quite entire, 8–12 cm. long, the basal sinus deep but broad; peduncles much longer than leaves, usually 3-flowered, pedicels incrassate, 1–2.5 cm. long, slightly glandular; sepals ovate, acuminate, mucronate, 12 mm. long; corolla hypocrateriform, the cylindrical tube 5–7 cm. long, greenish or yellow, minutely pubescent, the horizontally spreading limb 5 cm. across, intense orange-scarlet, the subrotund lobes mucronulate with a central plica in each; stamens much exserted, style slightly; stigma biglobular; fruit globose, 4-celled, the sepals appressed.—Named for Mr. Nation, long a resident in Peru, who has collected and studied the plants of the region; it is cultivated at Lima (Hooker).

Lima: Steep rocky slope, *144* (det. van Ooststroom). Near Lima, *Weberbauer 146; 164; 166; Goodspeed 30238.* Amancaës, (*Mathews 721,* type); *Stork & Horton 9261* (det. Johnston).

Ipomoea Nil (L.) Roth, Cat. Bot. 1: 36. 1797. *Convolvulus Nil* L. Sp. Pl. ed. 2. 219. 1762. *I. hederacea* (L.) Jacq. Coll. Bot. 1: 124.

1786. *C. hederaceus* L. Sp. Pl. 154. 1753, in part. *I. cuspidata* R. & P. Fl. Peruv. 2: 11, *pl. 119*. 1799. *I. villosa* R. & P. l.c. 12, *pl. 121?* *I. longicuspus* Meissn. in Mart. Fl. Bras. 7: 227. 1869.

Stems terete, twining, retrorsely subappresed hirsute; petioles 2.5–10 cm. long or longer; leaves cordate with 3 ovate acuminate lobes (the middle usually broadened at base), ordinarily 5–15 cm. long, more or less densely appressed pilose especially above; peduncles shorter or longer than petioles, 1–few-flowered; bracts linear, deciduous; pedicels much shorter than the equal linear-lanceolate sepals, these hirsute with firm yellow spreading trichomes especially toward the non-dilated base, about 3 mm. wide, to 2.5 cm. long; corolla tubular-funnelform, blue or tube nearly white, 4–7 cm. long; ovary 3-celled, glabrous; capsule subglobose, apiculate (style base), the 6 or fewer seeds smooth.—Leaves of La Brea plants almost velvety above (Svenson). Some botanists use the name *I. hederacea* which can be avoided by the fact—or supposition—that it was based on a mixture. Illustrated, Svenson (Amer. Bot. 33: 474, *pl. 17, fig. 1*).

Piura: River gravels near La Brea, (*Haught & Svenson 11219*).—San Martín: Tarapoto, *Williams 6513*. Río Chumbaza, *Woytkowski 35135* (det. Cuatrecasas). Juanjuí, *Klug 4229* (det. Standley).—Lima: Prov. Huarochiri, *Goodspeed 11336; 11501* (det. Johnston). San Bartolomé, *Weberbauer 5299* (det. O'Donell). Huará, *Ruíz & Pavón* (type, *I. cuspidata*); Río Rimac Valley, *Goodspeed Exped. 30225* (det. Leonard).—Huánuco: Muña and Pozuzo, (*Ruíz & Pavón*, type, *I. villosa*).—Junín: Chanchamayo, *Isern 2102*. La Merced, *5430*.—Loreto: Yurimaguas, *Williams 4088*.—Ayacucho: Aína, *Killip & Smith 22739*. Tropics, both hemispheres.

Ipomoea Pearceana O. Ktze. Rev. Gen. 2: 443. 1891.

Erect shrub to 2.5 meters high, the branches ligneous, the branchlets sericeous with fine appressed trichomes, toward tip (as young leaves) sericeous-tomentose; petioles 0.5–6.5 cm. long; leaves ovate, entire, truncate or more or less cordate at base with rounded auricles, acute or obtuse, mucronate, 4–9 cm. long, 4.5–8.5 cm. wide, glabrous or appressed-pubescent above toward the edges, more or less sericeous beneath, especially on the prominent nerves; cymes tomentose including the buds, 3–9-flowered, branched, the secondary peduncles 3–4-verticillate, alternate or rarely opposite; peduncles to 4.5 cm. long; bracts linear-lanceolate, foliaceous, about 2–3 cm. long, the similar bractlets 1.3–2.4 cm. long, pedicels nearly 1–3 cm. long; sepals subequal, elliptic to obovate or oblong, obtuse or acute, mucronate, the outer 17 or 18–25 mm. long, 6–9 mm. wide; corolla infundibuliform, 5–6 cm. long, roseate, medially sericeous; stamens 32–38 mm. long and 25–28 mm. long, the filaments basally glandular pubescent, the anthers 7 mm. long; ovary ovoid, glabrous, 2-celled, 4-ovuled; style about 2.5 cm. long; stigmas globose.—After O'Donell (Lilloa 26: 377. 1953), who remarked that the inflorescence is singular for the family; species only keyed by author but type found by Sandwith to match *Vargas 4877*.

Apurímac: Valle del Apurímac, (*Pearce*, type). Pachachaca, Prov. Abancay, *Vargas 1444; Goodspeed Exped. 10516*.—Cuzco: Sisal Cunyacc, Prov. Anta, *Vargas 4877*. Tablachaca Bridge, Río Apurímac Canyon, *West 3847* (det. Johnston).

Ipomoea Peckoltii Meissn. in Mart. Fl. Bras. 7. 268. 1869.

Stems slender, glabrous, the internodes long; petioles finally about 2.5 cm. long or sometimes much longer; leaves cordate-ovate, obtusely acuminate, typically puberulent or glabrate beneath, 2.5–6.5 cm. long, 1.5–4.5 cm. wide or in variety much larger; peduncles to 5 cm. long, bifurcate, the branches 1.5–2.5 cm. long, pedicels 3–10 mm. long, bracts setaceous; flowers 5–9 in type, scarcely 2 cm. long; sepals herbaceous-membranous, ovate-oblong, subacute, subequal, glabrous, 4 mm. long; corolla tubular-funnelform, the tube white, the limb blue; stigmas bicapitate; capsule ovoid, the sericeous seeds tuberculate dorsally.—Var. *major* Meissn. l.c. from the mouth of the Solimões has petioles 7–10 cm. long, leaves glabrous, about 7.5 cm. long, corolla 2.5 cm. long. *Killip & Smith 24192* has seeds pubescent on the angles, one of Woytkowski very slightly. Van Ooststroom compared his determinations with the type, *Sellow 831* in herb. Dahlem; corolla pink-purple, paler or yellow-green basally. Illustrated, l.c. *pl. 99*.

Junín: Huacapistana, *Killip & Smith 24192*.—Loreto: Aguaitia, *Woytkowski 34437; 34457* (det. Cuatrecasas, *I. oligantha*).—Ayacucho: Aína, *Killip & Smith 22740*.

Ipomoea peruviana O'Donell, Bol. Soc. Peru. Bot. 1: 4. 1948.

Twiner, quite glabrous except for the basally glandular pubescent filaments; branchlets angulate, 4–5 mm. thick; petioles often a dm. or two long; leaves ovate, sometimes broadly 3-lobed, widely subcordate at base, the auricles rounded, the apex (or tips of the subovate lobes, the medial basally contracted) acuminate, mostly 1.2 cm. to nearly 2 dm. long, 11–15 cm. wide, the margin unevenly undulate or with a few short teeth toward the base where palmately 9-nerved;

cymes few–9-flowered, the peduncles 8–14 cm. long, pedicels stout, about 2–2.5 (3) cm. long; bractlets ovate, 1.5–2 mm. long; buds ovoid, acute; sepals obtuse or subacute, mucronate, subequal, 22–24 mm. long, 13–15 mm. wide, elliptic or the outer ovate; corolla funnelform, lilac or violet, 8–11 cm. long; anthers 1 cm. long, pollen echinate; ovary ovoid, attenuate to style.—No relationship suggested by the author but resembles *I. Batatas* with much smaller flowers; Standley referred the type, with query, to the somewhat pubescent *I. setifera* Poir. Illustrated, O'Donell (l.c. 8, 9).

San Martín: Juanjuí, *Klug 4326*.—Loreto: Balsapuerto, *Klug 3089*, type.

Ipomoea Pes-Caprae (L.) Sweet, Hort. Suburb. Lond. 35. 1818. *Convolvulus Pes-Caprae* L. Sp. Pl. 159. 1753.

Glabrous succulent perennial, the stems long-trailing (even several meters), angulate, often compressed; leaves rather thick, more or less subrotund, emarginate or bilobed at apex, often somewhat cordate, 2.5 cm. to 2 dm. wide, usually shorter than wide, the veins all parallel; petioles and stout peduncles often 2.5–10 cm. long, 1–several-flowered; sepals unequal, or apparently sometimes subequal, ovate-lanceolate to ovate-elliptic, obtuse, mucronulate, the outer 6 mm., the inner about 10 mm. long; corolla funnelform, typically purple, 4–5 cm. long (or shorter?), the tube 2–2.5 cm. long; ovary subglobose, glabrous, 2-celled, the capsule about 1.5 cm. thick with 4 or fewer tomentose seeds.—A detailed description by Hans Hallier f., including family and generic characters, may be found in Bull. Herb. Boiss. ser. 1, 5: 376–377. 1897. This species which Meissner (Mart. Fl. Bras. 7: 256. 1869) reduced with query here, has been confused, apparently, by Svenson (Amer. Journ. Bot. 33: 477. 1946) with *I. crassifolia* or there is a white small-flowered vine or variety; the Peruvian specimens have the large (but white!) flowers and parallel transverse veins that presumably identify the species; the hyphen in the unique name respects usage more than precision.

Loreto: Boqueron Padre Abad, *Woytkowski 485* (*34485* of Goodspeed Exped., det. Cuatrecasas, affine). Tropical or subtropical shores, river margins.

Ipomoea phillomega (Vell.) House, Ann. N. Y. Acad. Sci. 18: 246. 1908. *Convolvulus phillomega* Vell. Fl. Flum. 74. 1825; Icones 2: *pl. 63*. 1827. *I. capparoides* Choisy, Mém. Soc. Phys. Genève 8: 59. 1838. *I. macrophylla* Choisy in DC. Prodr. 9: 374. 1845 (as to Peru?).

Lower stems stout and more or less ligneous, hollow, glabrous as sometimes the entire plant or the leaves often sparsely appressed-pilose beneath; petioles slender, 3–10 cm. long, canaliculate above; leaves more or less cordate, broadly ovate to subreniform, acutely and abruptly short-acuminate, 5–12 cm. long or longer, often nearly as wide, the subparallel lateral nerves prominent beneath; peduncles stout, usually elongate, the flowers frequently in large corymbose panicles or in Peru several and subumbellate; bracts oblong, to 12 mm. long, deciduous sepals reddish, ovate or orbicular, ciliolate, obtuse, in Peru subequal (rarely in Surinam), usually the 2 outer 1.5 cm. long, the inner about 1 cm. long; corolla campanulate, dark lilac or pink, 4 (–5, Peru) cm. long, with 5 transverse glandular processes between the broad glandular filament bases; ovary glabrous, 2-celled as the 4-seeded capsule, this villous within.—After van Ooststroom, who determined most of the following and noted in herb.: resembles specimens identified by Hallier f. as *I. capparoides* but the sepals are equal and the corolla is generally larger; perhaps a distinct species or a variety. The Goodspeed Expedition specimen had white flowers and was a shrub 1–3 meters high. *Tessmann 5023* from Parimari was determined in Herb. Dahlem by Helwig as *I. macrophylla* Choisy, type Pará, Hort. Paris; ex char. it seems probable that this specimen at least belongs here.

Loreto: Iquitos, *Killip & Smith 27337; Klug 670; 816; 1149; Williams 7952.* Yurimaguas, *Williams 7880.* Manfinfa, *Williams 1095.* Río Mazan, *José Schunke 211; 228* (det. Standley).—Apurímac: Pachachaca Valley, *Goodspeed Exped. 10561* (det. Standley). Abancay, *Balls 6838* (det. Killip). To Central America and the West Indies. "Cumal-wasca" (Williams); "sacha-camote" (Schunke).

Ipomoea piurensis O'Donell, Lilloa 26: 382, *pl. 13.* 1953.

Annual little-branched herb, the primary stem early erect, later decumbent or twining; root perpendicular; cotyledons bifid; branchlets 1–3 mm. thick, glabrous or sometimes pubescent at nodes, these 1.5–10 cm. distant; petioles 1–9 cm. long, obscurely or not muricate; leaves ovate, sometimes with 1–3 teeth, generally on the lower portion, apically acute to acuminate, rarely obtuse, mucronulate, 3–7 cm. long, 2–6 cm. wide, glabrous or with a few simple trichomes beneath toward the cordate base, the auricles rarely acute; cymes monochasial, (1) 2–3-flowered; peduncles stout, 1–6 cm. long, obscurely if at all pubescent; bracts and bractlets ovate, obtuse to acute, mucronate, 2–3 and 1–2 mm. long; pedicels stout, 3–6 mm. long; sepals glabrous, mucronate, obtuse, elliptic or the inner subovate, 5 or 6–9 mm. long, 3.5–5.5 and 4–6 mm. wide; corolla glabrous, typically white (may be violet within), 20–22 mm. long; stamens 14–15 and 12–13 mm. long, the anthers 2 mm. long; ovary ovoid, glabrous, style 11 mm. long, stigma globose; capsules 9 or 10 mm. in diameter, apiculi 2–3 mm. long, 2-celled but apically 4-celled, the reflexed sepals notably rugose; seeds gray, 6 or 7 mm. long, tomentose with long trichomes.—Forma *rosea* O'Donell (l.c. 384), of Colombia, British Guiana and Brazil, is described as more robust, the corolla roseate; near *I. dumetorum* Willd., to which the Peruvian plant has been referred, but that, according to O'Donell, differs in completely 2-celled capsules, the black seeds velvety with very short indument, pedicels many, long and reflexing, petioles muricate below. The author remarks that it is noteworthy in flowering in the axils of the first leaves after those of the cotyledons. *Haught 55* in Chicago Museum has the large flowers of *I. carnea* so the collection must have been mixed. Illustrated, Svenson (Amer. Journ. Bot. 33. 474, *pl. 17, fig. 6*, as *I. dumetorum*).

Piura: Parinas Valley, *Haught 142*, type. Paita and Talara, *Haught 55, 55a*. La Brea, (*Svenson 11225*). Ecuador; elsewhere in northern South America?

Ipomoea polyanthes Roem. & Schult. Syst. 4: 234. 1819; 477. *I. umbellata* (L.) G. F. W. Meyer, Prim. Fl. Essequeb. 99. 1818, not L. Syst. Nat. ed. 10. 924. 1759. *Merremia umbellata* (L.) Hall. f. Bot. Jahrb. 16: 552. 1893. *Convolvulus umbellatus* L. Sp. Pl. 155. 1753.

Glabrous to lightly or rarely densely tomentose twiner with narrowly to broadly ovate deeply cordate-sagittate leaves and usually umbelliform cymes of yellow funnelform flowers, these infrequently solitary; petioles often shorter or only equaling the leaves, these often several to 10 cm. long or longer, a half to two-thirds as wide, acutely or obtusely acuminate; peduncles usually as long as the petioles or longer; bracts linear, deciduous; bud obtuse; sepals subequal, glabrous, broadly ovate to suborbicular, obtuse, often becoming erose; corolla 2.5–3.5 cm. long; anthers not contorted; ovary glabrous, 2-celled as the subglobose 2-celled capsule, the 4 seeds tomentulose. —Determinations mostly by van Ooststroom, who cited (as synonym) the illustration of *I. mollicoma* Miq. (Stirp. Surinam. 132, *pl. 37*). Illustrated, Lilloa 5: 42, *fig. 1*.

Piura: Talara, *Haught 66*.—San Martín: Zepelacio, *Klug 3574* (det. Standley).—Huánuco: Pozuzo, *4713*.—Junín: Puerto Yessup, *Killip & Smith 26300*. Hacienda Chanchamayo, *Diehl 2480*.—Loreto: Cabello-cocha, *Williams 2461*. Aguaitia, *Woytkowski 34458* (det. Cuatrecasas). Florida, *Klug 2095* (det. Standley). Tropics.

Ipomoea pubescens Lam. Illustr. 1: 465. 1791. *I. papiru* R. & P. Fl. Peruv. 2: 11, *pl. 120, fig. a.* 1799. *I. subtriloba* R. & P. l.c. 12. *Convolvulus pubescens* (Lam.) Willd. Enum. Hort. Berol. 1: 203. 1809. *Pharbitis pubescens* (Lam.) Choisy in DC. Prodr. 9: 344. 1845.

Tuberous; stems slender, twining or trailing, retrorsely canescent strigose, glabrate in age; petioles 0.5–2.5 cm. long; leaves cordate-ovate, obtuse, or deeply 3–5-lobed, early more or less appressed-sericeous-pilose to glabrate in age above, about 2–3 cm. long and nearly as broad, the segments, if present, unequal, more or less strongly narrowed at base, obtuse or acute; bracts linear-subulate, 6–8 mm. long; peduncles 1 (–2) -flowered; sepals persistingly appressed-sericeous-pilose, ovate-acuminate, the outer subcordate at base, 1.2–2 cm. long, the lanceolate inner shorter; corolla roseate or purple-red, tubular-funnelform, to 4 cm. long, 3–4 cm. across at top; capsule subglobose, glabrous, the 4 pulverulent seeds lustrous.—The calyx nearly simulates that of *Aniseia* (Meissner). The tuberous root is used as a very strong purgative (Ruíz & Pavón).

Junín: Tarma, *Ruíz & Pavón* (type, *I. papiru*); *Weberbauer*, 176. Huasahuasi, *Ruíz & Pavón*, (type, *I. subtriloba*).—Cuzco: Calca, Valle del Urubamba, 3,100 meters, (*Herrera 1853*). "Papiru" (Ruíz & Pavón).

Ipomoea pulcherrima van Ooststr. Recueil Trav. Bot. Néerl. 30: 206. 1933.

Erect lactescent shrub, the younger angled branches densely short-tomentulose or puberulent as petioles, these 1.5–3 cm. long, leaves, especially beneath, and inflorescence except the sepals and roseate corollas, these both quite glabrous without; leaves nearly orbicular, 5–10 cm. across, subcordate or truncate at base, broadly rounded at top, mucronate, glabrescent above, the 8–10 primary nerves prominent beneath, the secondary parallel; cymes 1 (rarely 2–3-) -flowered, disposed in terminal and axillary racemes, 1–4 cm. long, the peduncles 2–5 mm. long; bracts deciduous, strongly lineolate, thick, oblong or subulate, 3–6 mm. long, the lower sometimes foliaceous; pedicels to 1 cm. long, clearly glandular below the calyx; bractlets oblong or subovate, scarious, nearly glabrous, 2–2.5 mm. long, the orbicular sepals rounded, truncate or subemarginate, submucronulate, the outer 7 mm. long, the inner 10 mm. long; corolla funnelform, 4–5 cm. long, glandular pilose about the stamens, the filaments 1.5 and 2 cm. long, affixed 6 mm. above the base, little dilated below; anthers 6 mm. long; ovary conical, style 8–14 mm. long, stigmas 2, spongiosepapillose.—No relationship suggested by the author, who illustrated it (l.c. 194, *fig. 1*).

Apurímac: At 1,100 meters, *Weberbauer 5875*, type.

Ipomoea purpurea (L.) Roth, Bot. Abh. 27. 1787. *I. hirsutula* Jacq. f. Eclog. 1: 65, *pl. 44*. 1811–16. *I. diversifolia* Lindl. Bot. Reg. 23: *pl. 1988*. 1837. *Pharbitis Nil* (L.) Choisy, var. *diversifolia* (Lindl.) Choisy in DC. Prodr. 9: 343. 1845 (synonymy after O'Donell for var. *diversifolia* (Lindl.) O'Donell, Lilloa 26: 385. 1953). *I. glandulifera* R. & P. Fl. Peruv. 2: 12, *pl. 121*. 1799?

Twining simple or branched annual, the branches 1–3 mm. thick, laxly pubescent to tomentose with short or longer appressed trichomes, as the petioles, these 1–14 cm. long, the leaves, especially beneath on the prominent nerves, and the (1) 2–5-flowered cymes; leaves ovate, entire or in Peru (var. *diversifolia*), more or less 3-lobed, rarely 5-lobed, or some leaves entire, variably cordate at base, usually acute or acuminate, mucronate, as lobes if present, the middle one elliptic or obovate, the lateral semiovate to lanceolate; peduncles 0.2–15 cm. long; bracts and bractlets linear to lanceolate, 1.3–9 and 4.5 mm. long; pedicels 5–16 mm. long, reflexed and lengthening to 2.5 cm. in fruit; buds acute, glabrous; sepals more or less lanceolate or the outer narrowly elliptic-caudate, all 8–15 mm. long or longer, 2.5–4.5 (inner to 3.5) mm. wide, acute to acuminate, appressed or laxly pilose, at least dorsally; corolla infundibuliform, blue, white or rose, with the tube lighter within, to 5 cm. long, glabrous; stamens 18–25 and 13–22 mm. long, anthers 1.5–2 mm. long; ovary ovoid, glabrous, 3-celled, 6-ovuled; style 14–22 mm. long, stigmas 3, globose; capsules 1 cm. in diameter; seeds black or grayish, 5 mm. long, finely tomentulose.—After O'Donell, from plants grown from Mexican seeds. The name of Ruíz and Pavón refers to plants more or less glandular on the peduncles near the base, their specimens (in part cultivated) from Lima, Chancay and Huánuco. Illustrated, O'Donell, l.c. *pl. 14*.

San Martín: San Roque, *Williams 7465*.—Lima: Near Lima, (*Mathews 2050; Ball; Savatier*). Matucana, *259*. Chosica, *Soukup 2050*.—Huánuco: Near Huánuco, *2063; 3212; 3531; Sawada P99*. Casapi, (*Mathews 2050*).—Junín: Utcuyacu, Prov. Tarma, *Woytkowski 35389; 35390*. Pichis Trail, *Killip & Smith 25720*.—Ayacucho: At Ayacucho, *Soukup 4031*.—Apurímac: Prov. Abancay, *Goodspeed Exped. 10581*; (*Marin 2046*).—Cuzco: Río Apurímac, *Vargas 855*.—Tacna: Near Tacna, *Metcalf 30355* (det. Leonard, aff. *I. opulifolia*

Rusby). Argentina to southwestern United States. "Auroras" (Ruíz & Pavón).

Ipomoea Quamoclit L. Sp. Pl. 159. 1753. *Convolvulus pinnatus* Desr. in Lam. Encycl. 3: 567. 1791. *Quamoclit pinnata* (Desr.) Bojer, Hort. Maurit. 224. 1837. *Q. vulgaris* Choisy, Mém. Soc. Phys. Genève 6: 434. 1833.

Glabrous slender-stemmed twining herb with finely pinnate leaves, the linear to filiform parallel acute divisions (8–15 pairs) extending even to the midrib, often 1–1.5 cm. long, even longer, the leaves usually 3–4 cm. long; petioles ordinarily 2–3 cm. long; peduncles 5–15 cm. long, 1–several-flowered; corolla tubular-cylindric, scarlet or white, often 3 cm. long, the spreading lobes of the limb subacute; stamens and style exserted; sepals ovate-lanceolate, mucronate, subequal, about 6 mm. long in fruit, the capsule to about 7 mm. in diameter, 4-seeded. —Often escaped from cultivation as an attractive vine, in English as "Cypress," and sometimes becoming a weed. Illustrated, Bot. Mag. 7: *pl. 244*, and many others.

Junín: Satipo, *Soukup 2843*.—Loreto: Iquitos, *Williams 7892; Klug 229; Killip & Smith 27261*. Puerto Arturo, *Williams 5020*. Yurimaguas, *Williams 4087; 4853*. Balsapuerto, *Klug 3115*. Ríos Nanay and Itaya, *Williams 420; 3203*.—Cuzco: Quillabamba, *Soukup 182*. East Indies. "Enredadera."

Ipomoea quinquefolia L. Sp. Pl. 162. 1753; 529. *Convolvulus quinquefolius* L. Syst. Nat. ed. 10: 923. 1759. *Batatas quinquefolia* (L.) Choisy, Conv. Rar. 127. 1838. *Merremia quinquefolia* (L.) Hall. f. Bot. Jahrb. 16: 552. 1893.

Slender-stemmed twiner or trailer, glabrous or nearly; petioles 0.5–2.5 cm. long; leaves palmately (3) 5-divided, the ovate-oblong or -linear leaflets more or less acute at both ends, mucronulate, crenate-serrate, the somewhat larger medial ones to about 3 cm. long, a third as wide; peduncles usually longer than the leaves, laxly dichotomous, glandular, 3–6-flowered; buds acute; sepals glabrous, ovate, the inner 5–7 mm. long, obtuse, the outer considerably shorter; corolla light yellow, funnelform, about 1.5–2.5 cm. long; capsule globose, 4-celled, the 4 seeds canescently pilose-lanuginose or finally glabrate.—My collection was from a densely matted vine of fence rows.

Ancash: Casma, *2570* (det. van Ooststroom).—Huánuco: Cuchero and Macora, *Ruíz & Pavón*. To Mexico and Jamaica.

Ipomoea ramosissima (Poir.) Choisy in DC. Prodr. 9: 377. 1845. *Convolvulus cymosus* R. & P. Fl. Peruv. 2: 9, *pl. 117, fig. b.* 1799, not *I. cymosa* (Desr.) Roem. & Schult. *C. ramosissimus* Poir. Encycl. Suppl. 3: 468. 1814.

Branched, typically quite glabrous, rarely hirsute; petioles 2.5 cm. long, pilose in the axils, much exceeded by the 4–8-flowered apically incrassate peduncles; leaves cordate-ovate, rarely lobed, acutely acuminate, mucronulate, the auricles obtuse, 2.5–5 cm. long; pedicels short, umbellately cymose, often densely, bracteolate; sepals subequal, the outer yellowish, ovate-oblong, obtuse, mucronulate, the inner lanceolate, acute, 4–6 mm. long; corolla white or infrequently roseate, to about 3 cm. long; capsule 4-celled, glabrous as the 4 seeds. —The pubescent state has been named var. *hirsuta* Hall. f. Determinations by van Ooststroom. F.M. Negs. 13819; 27037.

San Martín: San Roque, *Williams 7220; 7809.* Vitoc, *Ruiz & Pavón* (det. Pilger).—Huánuco: Pozuzo, *Ruiz & Pavón*, type; *4675.* Río Chinchao, *5000.*—Junín: Río Perené, *Killip & Smith 25231.*—Loreto: Near Iquitos, *Williams 1445; 1538; 3547.*

Ipomoea reticulata O'Donell, Lilloa 26: 389, *pl. 15.* 1953.

Ligneous branching twiner, the glabrous or glabrescent branchlets 1–7 mm. thick, the older bark lenticellate; petioles 1–15 cm. long, nearly or quite glabrous; leaves ovate, entire, biglandular at the lightly sinuate to subtruncate base (auricles rounded), acute to acuminate, often caudate, mucronate, 3–18 cm. long, 1.5–17 cm. wide, glabrous or both sides more or less laxly pilose especially on the nerves, these prominent beneath, the nearly parallel tertiary forming a notable reticulation, at times with some obscure glandular points; inflorescence glabrous, paniculiform, the ramifications alternate; peduncles angled, 0.5–7.5 cm. long; bracts and bractlets caducous, leaving a semicircular scar; pedicels 7–14 mm. long; buds obtuse; sepals not concave, not mucronate, obtuse, marginally hyaline, the outer elliptic, 5–7 mm. long, 3–4.5 mm. wide, glabrous or with a few marginal trichomes, the inner obovate to suborbicular, usually truncate, 6–7 mm. long, 5–5.5 mm. wide; corolla infundibuliform, white or tinted, 2.5–3.5 cm. long, glabrous or nearly, marginally 5-lobate; stamens 18–20 and 15–19 mm. long, filaments densely glandular pubescent, the long (2–2.5 mm.) trichomes forming an annulus at the insertion of the stamens, the anthers 3–3.5 mm. long; ovary ovoid, glabrous, 2-celled, 4-ovuled; style 1.5–2 cm. long, stigmas 2-globose; capsules subquadrangular, 10–12 mm. long, 2-celled seeds grayish, 5–5.5 mm. long, or 7–11 mm. with the lax pubescence.—Corolla crepe-like white (Haught); white, violet and cream (Klug) or cream-colored and white (Klug). The paniculiform inflorescence is very characteristic as are the caducous bracts and reticulate nervation from which it has been confused with *I. squamosa* Choisy with sepals mucronate; *I. saopaulista* O'Donell, of Brazil and Paraguay, is usually more pubescent, the ramifications of the inflorescence ordinarily more or less crowded apically and the interior sepals somewhat concave, larger, the white corollas 3.5–5 cm. long (author).

Junín: Near La Merced, 1,300 meters, *Killip & Smith 23854.* Hacienda Schunke, *5733.* To Colombia.

Ipomoea setifera Poir. in Lam. Encycl. 6: 17. 1804. *I. ruber* (Vahl) Millsp. Field Mus. Bot. 2: 86. 1900, not Murray. *Convolvulus ruber* Vahl, Eclog. 2: 12. 1798. *Calystegia setifera* Meissn. in Mart. Fl. Bras. 7: 316. 1869. *I. rubra* (Vahl) Millsp. var. *albo-flavida* Urban, Symb. Ant. 3: 345. 1902.

Stems herbaceous, twining, pilose or glabrate, the younger usually densely yellowish pilose, the trichomes spreading; petioles 2.5–7 cm. long; leaves ovate-oblong, subacute to subemarginate, entire, glabrous, deeply cordate, the auricles rounded, often 5–10 cm. long, 2.5–7 cm. wide; peduncles stout, to 2 dm. long, glabrous, often several-flowered; bracts at base of pedicels (1.5–2 cm. long), herbaceous, to 2 cm. long, outer sepals obtuse or subacute, aristate-setose, about 1.5 cm. long, 6–8 mm. wide, glabrous, the prominent nerves serrulate, the inner sepals acute or acuminate, 10–12 mm. long; corolla funnelform, 5–7 cm. long, purple, glabrous; stigmas oval; seeds tomentose-puberulent (Choisy).—Var. *Poeppigii* Meissn. has smaller sublobate or subtrilobate leaves. Standley in herb. suggested that *Klug 3089* from Balsapuerto may belong here; however, it has 6-flowered peduncles and glabrous stems and is *I. peruviana* O'Donell, apparently distinct.

Peru (possibly). Brazil to West Indies; Central America.

Ipomoea squamosa Choisy, in DC. Prodr. 9: 376. 1845.

Twining, semiligneous, glabrous or the terete striatulate stems, membranous leaves on the nerves beneath and petioles—these 4–9 cm. long—sparsely to densely short-pilose; leaves ovate or ovate-oblong, cordate, the rounded auricles sometimes with a large tooth, acute or acuminate, mucronate, 8–15 cm. long, 5–10 cm. wide; peduncles to 14 cm. long, the few to several flowers in an umbelliform cyme, the pedicels at least as long as the calyx; sepals elliptic, obtuse, mucronate, narrowly scarious-margined, the outer only 3–5 mm. long, the inner 7–8 mm. long; corolla infundibuliform, lilac, about 5 cm. long; ovary glabrous, the low annular disk somewhat 5-lobed.—The subappressed sericeous-villous plant is var. *villosa* van Ooststr. (Recueil Trav. Bot. Néerl. 30: 211. 1933). Specimens (as determined) have been noted as having greenish, white (or partly) to pink or purple flowers.

San Martín: Juanjuí, *Klug 4305; 4356.* Chazuta, *Klug 4135.* Near Tarapoto, *Williams 6649; Woytkowski 35125.* Zepelacio, *Klug 3603.*—Huánuco: Valley of the Monzón, (*Weberbauer*, 286).—Junín: Puerto Yessup, *Killip & Smith 26317; 26345.* La Merced, *5387; 5539* (both var.).—Loreto: Río Mazán, *José Schunke 226.* Río Itaya, *Williams 117.* Aguaitia, *Woytkowski 34439; 34456* pt. (det. Cuatrecasas). Iquitos, *Killip & Smith 27267; Klug 1067; Mejia 6408.* Florida, *Klug 2049.* La Victoria, *Williams 3096.* Caballo-cocha, *Williams 2278.* Pebas, *Williams 1858.*—Cuzco: Echarate, Prov. Convençion, *Goodspeed Exped. 10495* (det. Standley). Northern Brazil. "Sachamote."

Ipomoea tiliacea (Willd.) Choisy in DC. Prodr. 9: 375. 1845. *Convolvulus tiliaceus* Willd. Enum. Hort. Berol. 1: 203. 1809. *I. fastigiata* Sweet, Hort. Brit. ed. 1. 288. 1826.

Stems twining, slender but subligneous, striatulate, glabrous to hirsute as the solitary or usually binate peduncles, these often longer than the petioles (3–6 cm. long), dichotomously branched, few–several-flowered; leaves commonly membranous, glabrous or appressed-pilose, ordinarily ovate, cordate, acuminate, mucronulate, entire to strongly lobed, 5–12 cm. long, 3–8 (9) cm. wide; bracts small, subulate, sometimes (as sepals) more or less hispid-ciliate; sepals usually thin-coriaceous, mucronate, subequal or unequal, the outer oblong-lanceolate-ovate, acute, 4–8 mm. long, the inner ovate to suborbicular, acute or rounded and to 1 cm. long; corolla purple or pink to white, funnelform, subabruptly narrowed toward base, 5–6 cm. long; capsules globose, 2-celled, commonly glabrous as the 4 triangular seeds or these marginally pilose.—Svenson (Amer. Journ. Bot. 33: 477. 1946) regarded the Peruvian and adjacent Ecuador specimens as "affine," variable in leaf- and sepal-texture, pubescence, and noted pubescent capsules. And van Ooststroom in herb. determined without question *Killip & Smith 26627* as *I. Regnellii* Meissn. (in Mart. Fl. Bras. 7: 266. 1869) from central Brazil, the "acutely acuminate leaves quite glabrous beneath, sepals subsericeous and constantly ciliolate"—characters at variance with the Peruvian specimens. However, as noted by Svenson, the interpretation of *I. tiliacea* needs clarification.

Piura: Chulucanas, *Weberbauer 6434*.—Junín: Satipo, *Soukup 2847*. Puerto Bermudez, *Killip & Smith 26627* (det. van Ooststroom, *I. Regnellii*).—Loreto: Aguaitia, *Woytkowski 34456* (det. Cuatrecasas). Puerto Arturo, *Killip & Smith 27838*. Tropical America.

Ipomoea tricolor Cav. Icones 3: 5, *pl. 208*. 1796. *Convolvulus pulchellus* HBK. Nov. Gen. & Sp. 3: 101. 1819. *I. pulchella* (HBK.) G. Don, Gen. Syst. 4: 276. 1838, not Roth. *I. oligantha* Choisy in DC. Prodr. 9: 380. 1845. *C. pauciflorus* Willd. ex Roem. & Schult. Syst. 4: 302. 1819. *I. dumetorum* Willd. ex Roem. & Schult. l.c. 789, probably, at least as to Peru. *Quamoclit mutica* Choisy, l.c. 335?

Glabrous, trailing or twining; petioles usually 2–several cm. long, often glandular-verruculose near base; leaves cordate-ovate, acuminate, the auricles rounded to somewhat undulate and subacute, reticulate-veined, membranous, ordinarily several to about 7 cm. long, nearly as wide; peduncles frequently about as long or longer than the petioles, usually few-flowered, the pedicels more or less incrassate in fruit, a cm. long or longer; bracts subulate, acuminate, nearly minute; sepals subequal, oblong-oval or -elliptic, rounded or obtuse or the slightly shorter outer subacute, minutely mucronulate, scarious-margined, medially firm or fleshy, more or less darker maculate, 4–7 mm. long; corolla funnelform, about 3 cm. long (or larger in cultivation), pink to reddish-purple, the tube paler or white; capsule as seeds glabrous.—My indebtedness is acknowledged to Standley (in herb.) for the suggestion that the Cavanilles species, noted by Ruíz and Pavón as an ornamental, and described from plants cultivated in the botanical garden of Madrid, origin unknown, is the same as *I. oligantha* (*I. pulchella*), which apparently is merely a form with solitary flowers. F.M. Neg. 38962.

Ancash: Lomas de La Chay, *Goodspeed Exped. 9202*. Lomas de Monzón, *Goodspeed Exped. 9188*.—Lima: Cerro Augustín, *Soukup 2553*. Matucana, *100*. Near Lima, (*Weberbauer*, 146; *Dombey*).—Huánuco: Yanahuanca, *1232*. Mito, *1546; 3425*. Chaglla, *3647*.—Junín: Tarma, *Killip & Smith 21921*. Near Huancayo, *Killip & Smith 22026*.—Ayacucho: Huanta, *Killip & Smith 23339*.—Cuzco: Valle del Urubamba, (*Herrera 1688*). Valle del Paucartambo, (*Herrera 1821*). Machu-Picchu, *Vargas 822* (det. Standley).—Arequipa:

Mollendo, *Weberbauer*, 146. Mejía and Posco, (*Guenther & Buchtien 163; 163a*).—Moquegua: Carumas, *Weberbauer 7287*. Ecuador; Bolivia. Colombia?

Ipomoea tuberosa L. Sp. Pl. 160. 1753. *I. dissecta* (Jacq.) Pursh, Fl. Am. Sept. 145. 1814. *Merremia dissecta* (Jacq.) Hall. f. Bot. Jahrb. 16: 552. 1893. *M. tuberosa* (L.) Rendle in Thistleton-Dyer, Fl. Trop. Afric. 4, pt. 2: 104. 1905. *Convolvulus dissectus* Jacq. Obs. 2: 4, *pl. 28*. 1767. *I. sinuata* Ortega, Decad. 7: 84. 1798.

Stems hirsute or glabrous, 2–2.5 mm. thick; leaves commonly 5–7-parted, often basally, the segments rather similar or the middle ones only slightly larger, all usually coarsely to pinnately serrate or cleft, glabrous or pilose on nerves beneath, to 1 dm. long, and to 2.5 cm. wide; peduncles 1–5-flowered, 5–10 cm. long, pedicels 12–18 mm. long; sepals herbaceous, usually glabrous, rounded-ovate to lanceolate-ovate, mucronate, 2–2.5 cm. long; corolla broadly funnelform or campanulate, white, 3–4.5 cm. long; capsule subglobose, included in the enlarged calyx, 2-celled, the septum finally obsolete; seeds glabrous, 8 mm. long.—According to Meissner there is a form with sinuate or entire leaflets; as this has been found in Bolivia near the Peruvian boundary it is to be expected in Peru (van Ooststroom). Illustrated, Lilloa 5: 48, *fig. 3* and *pl. 2*, opp. page 52.

Peru (probably). Widely distributed, Bolivia to southern United States. "Cumal," "camoste" (Poeppig).

Ipomoea uniflora (Burm. f.) Roem. & Schult. Syst. 4: 247. 1819. *Convolvulus uniflorus* Burm. f. Fl. Ind. 47, *pl. 2*. 1768. *Aniseia uniflora* (Burm. f.) Choisy, Mém. Soc. Phys. Genève 6: 482. 1833. *C. martinicensis* Jacq. Stirp. Amer. 26, *pl. 17*. 1788. *A. martinicensis* (Jacq.) Choisy, l.c. 8: 66. 1838. *I. martinicensis* (Jacq.) G. F. W. Meyer, Prim. Fl. Essequeb. 98. 1818.

Prostrate or twining typically glabrous herb, the long-petioled leaves about oblong or somewhat lanceolate or elliptic, infrequently obovate, more or less attenuate at base, obtuse or often emarginate at the mucronate apex, usually about 5–8 cm. long, 1–3 cm. wide; peduncles 2–5 cm. long or longer in fruit, 1–3-flowered; bracts lanceolate, 2 mm. long; outer sepals somewhat decurrent, broadly ovate or elliptic, acute, 1.5–2 cm. long, nearly as wide, membranous, reticulate-veined, the ovate acuminate firmer inner much smaller; corolla white, to about 2.5 cm. long, pilosulous-banded, dentate, tube short; pollen smooth; stigmas globose; capsules ovoid, 1.5–2 cm. long, drying brown, the valves silvery within; seeds finely ciliolate marginally. —Illustrated, Mart. Fl. Bras. 7: *pl. 115, fig. 2* (as *Aniseia*).

Van Ooststroom questioned the identity of the plants of Burmann and Jacquin but Roberty (Candollea 14: 35. 1952) followed Choisy and probably saw the specimen of Burmann at Geneva. *Aniseia* Choisy, l.c., was retained as distinct by Roberty on the basis of free stamens, more or less hypogynous, corolla cupulate at very base; by van Ooststroom because of the smooth pollen. Clarke (in Hook. Fl. Brit. Ind. 4: 200. 1883) treated it as a subgenus while it was included here in the scholarly Fl. Gén. Indo-Chine 4: 231. 1915. Seemingly it has received recognition more by imitation than by character distinctions; that is, by distinctions that are not variable in development. O'Donell used the segregate name but apparently without any special consideration.

Loreto: Iquitos, *Killip & Smith 27201* (det. Standley). Leticia, *Williams 3050* (det. van Ooststroom). Tropics.

Ipomoea Vargasiana O'Donell, Bol. Soc. Peru. Bot. 1: 5. 1948.

Shrubs branching from the base or trees to 3 meters tall, glabrous unless for a few trichomes on the sepals within and many glandular trifid ones at the base of the short filaments; branchlets brownish-gray-barked, often 5–7 mm. thick, more or less leafless in flowering, the sepals and to some extent fruit valves persisting; petioles 1–4 cm. long; leaves ovate, 3–10 cm. long, about 2.5–7 cm. wide, openly cordate or subtruncate at base, acute to acuminate, the subparallel nerves prominent beneath; cymes 1–few-flowered in the upper axils, on short branchlets and terminal, the peduncles short or sometimes 2 cm. long or longer, pedicels erect, 1.5–3 cm. long; bractlets caducous; buds ovoid, acute; sepals ovate, concave, thick, subequal, 9–12 mm. long, 7.5–10.5 mm. wide, the outer acute, the inner obtuse or subobtuse, puberulent above within; corolla funnelform, 5–7 cm. long; stamens 15–21 mm. long, anthers 7–9 mm. long, pollen spinose; disk thick, fleshy; fruit valves 2 cm. long.—Perhaps will be found to have a pubescent variety in *I. calodendron* O'Donell of northern Peru; otherwise resembles the Mexican species *I. pauciflora* Mart. & Gal. and *I. Woolcoltiana* Rose; as the author remarks regarding his similar Peruvian tree the correct disposition of these forms must await more study and more collections. Usually branching from ground forming a loose bush, less often stout-trunked trees with slender arching branches in a broad crown (Balls); steep rocky slopes. Illustrated, O'Donell, l.c. 10 and 11.

Ayacucho: Below Huanta, 2,200 to 2,500 meters, *Weberbauer 5665; 5667*.—Apurímac: Río Apurímac, *Weberbauer 5899*. Pacachaca Valley, *West 3794; Goodspeed Exped. 10561* (det. Standley, *I. phillomeya*). —Cuzco: Sisal, Prov. Anta, (*Vargas 1021*, type). Limatambo, *Balls 6838; West 7023*. "Ahuachu" (Balls); "huanarpo deuce" (West).

Ipomoea Velardei O'Donell, Bol. Soc. Peru. Bot. 1: 6. 1948.

Twining, the striate branchlets 1.5–5 mm. thick, pubescent as petioles (4–16 cm. long) and peduncles (4–21 cm. long) with erect tubercle-based trichomes 2–4 mm. long; leaves ovate, often cordate, the auricles rounded, apex acuminate or sometimes cuspidate, mucronate, 6–20 cm. long, 4.5–20 cm. wide, sparsely pubescent above, ciliate, glabrous beneath; cymes 3–7-flowered; bracts suboblong, obtuse, 4–6 mm. long, 1-nerved, caducous, the bractlets similar but narrower; pedicels 6–14 mm. long, reflexing after anthesis and to 3 cm. long, pubescent with a few long retrorse trichomes; buds sericeous; sepals elliptic or subovate, obtuse, glabrous, subequal, 5.5–6.5 mm. long, 3.4–4.2 mm. wide; corolla funnelform, violet-blue, greenish within, 2.5–2.8 cm. long, long-hirsute without; stamens about 2 cm. and 17 mm. long, filaments glandular at base; ovary attenuate to style; capsule (immature) ovoid, 12 mm. long, 2-celled, 4-valved, glabrous. —Allied to *I. parasitica* (HBK.) G. Don and *I. tricolor* Cav. (*I. dumetorum* Willd. ex Roem. & Schult.) but differs by the long hirsute pubescence (author); dedicated to Professor Dr. O. Velarde Nuñez of the University of San Marcos.

Lima: Tornamesa, 1,600 meters, (*Nuñez 1633*, type, Univ. Nac. de Tucumán).

Merremia Weberbaueri van Ooststr. Recueil Trav. Bot. Néerl. 30: 200. 1933; 517.

Completely glabrous, the smooth or minutely verruculose stems prostrate or twining, 1.5–2.5 mm. thick; petioles 1.5–4 cm. long; leaves 5-parted more than medially, truncate or broadly cordate at base, the central lobe much exceeding the lateral, lanceolate or oblanceolate, narrowed to base, long-acuminate, mucronulate, 4–8 cm. long, 1–2.2 cm. wide, the lateral suboblong or ovate-lanceolate, little or not attenuate to base, obtuse, minutely mucronulate, the larger 2–3 cm. long, 6–15 mm. wide, the basal 1–2 cm. long, 6–12 mm. wide, all entire or obscurely crenulate; peduncles axillary, 1–2-flowered, 5–10 cm. long, branches 1–1.5 cm. long, pedicels incrassate apically, 1.5–2 cm. long, bracts deciduous, squamate, 2 mm. long; buds acute;

sepals membranous, elliptic or oblong, mucronulate, subequal or outer slightly shorter, 2.5–3 cm. long; corolla glabrous, roseate, broadly funnelform, 7–7.5 cm. long; filaments puberulent below; anthers spiralled, 7–10 mm. long; ovary 2-celled, cells 2-celled, style 28 mm. long.—Perhaps nearest *I. tuberosa* L. (*M. dissecta* (Jacq.) Hall. f.) but distinguished by the unlike, entire or finely crenulate leaf segments and much larger flowers (author). Illustrated (van Ooststroom, l.c. 201, *fig. 2*).

Huancavelica(?): Río Mantaro Valley, below Colcabamba, 2,200 meters, *Weberbauer 6473*, type.

11. JACQUEMONTIA Choisy

Includes for convenience species of *Ipomoea* with 2 ellipsoid-ovoid or filiform (Asian species) more or less complanate stigmas, free above; pollen smooth.—It is interesting and probably significant that *Cardiochlamys* Oliver of Madagascar with pollen spinulose as in most species of *Ipomoea* was allied by Hallier to this group while in characteristics it resembles *Turbina* and related forms. Except for the weight of tradition this could readily be regarded as a section of *Ipomoea*, a position that would probably more accurately indicate its immediate alliance. Indument stellate or lacking; stigmas rarely linear or globose (van Ooststroom). Victor Jacquemont was an early nineteenth century botanical explorer.

J. nodiflora (Desr.) G. Don or *J. verticillata* (L.) Urban fits in this genus because of the congested inflorescence but better in *Convolvulus* to avoid reduction in significance of the stigma character; however, *J. confusum* Meissn. (in Mart. Fl. Bras. 7: 294, *pl. 106, fig. 2.* 1869), aside from the difference in character of stigma, has, according to House (Muhlenbergia 5: 67. 1909), scarcely any other appreciable differences!

Sepals obtuse, subacute, rarely acute, sometimes mucronate.
  Shrub, branched, canescent........................*J. floribunda.*
  Vines, herbaceous or suffrutescent.
    Corolla glabrous or nearly; leaves about ovate or elliptic.
      Sepals glabrous or nearly, coriaceous or firm, shorter than or equaling the pedicels.
        Corolla blue, 2 cm. long or longer; stigmas about oblong.
          Leaves elliptic, apically rounded, mucronate..*J. elegans.*
          Leaves ovate, acute to acuminate.
            J. parvifolia, J. Blanchetii.

Corolla white, 1–1.5 cm. long; stigmas linear. . *J. nodiflora.*

Sepals usually tomentose, herbaceous, longer than pedicels. *J. prominens, J. unilateralis.*

Corolla densely pubescent; leaves rather oblong. . . *J. luxurians.*

Sepals shortly to long-acuminate or linear-lanceolate and long-hirsute.

Corolla notably pubescent; bracts broad, conspicuous.

Bracts ovate, acuminate, longer than sublinear sepals. *J. tamnifolia.*

Bracts oval, mucronate, as long as sepals. . . . . *J. lactescens.*

Corolla glabrous or lightly pubescent; bracts narrow, small.

Flowers about 2–3 cm. long; sepals minutely and abruptly cuspidate. . . . . *J. unilateralis.*

Flowers rarely about 2 cm. long; sepals more or less acuminate.

Sepals 1 cm. long or longer; flowers nearly 2 cm. long.

Leaves elliptic; mucro to 6 mm. long. . . . . *J. caudata.*

Leaves ovate-oblong, acute, mucronulate. . . . . *J. peruviana.*

Sepals rarely 8 mm. long; flowers about 1–1.5 (2) cm. long.

Sepals rather ovate, not glandular hirsute; flowers 12–15 (20) mm. long.

Stems and leaves soft-tomentose. . . . . *J. corymbulosa.*

Stems and leaves puberulent or glabrate. . . *J. pentantha.*

Sepals lanceolate, glandular hirsutulous; flowers 8–10 mm. long. . . . . *J. hirsuta.*

Jacquemontia Blanchetii Moric. Pl. Nouv. Amer. 41. *pl. 27.* 1838. *Montejacquia Blanchetii* (Moric.) Roberty, Candollea 14: 33. 1952.

Glabrous or essentially; petioles 1–2.5 cm. long; leaves cordate-ovate, acuminate, mucronate, 5–8 cm. long, 2.5–5 cm. wide, the nerves beneath sparsely pilosulous; peduncles 5–10 cm. long, shortly bifid apically, the umbelliform cymes 7–12-flowered; pedicels 2– finally 8 mm. long; sepals ovate, obtuse, membranous, apically ciliolate or glabrous, 4–5 mm. long, the outer about one-third shorter than the inner; corolla funnelform, to 2 (2.5) cm. long, in type blue, the throat 5-dentate.—Probably should be drawn to include *J. parvifolia* Helwig, typically more pubescent and with smaller leaves. *Montejacquia* Roberty, l.c., has been proposed as a genus to include species of *Convolvulus* and *Jacquemontia* with funnelform subentire mostly blue flowers borne in more or less dense axillary cymes!—Without data as seen, *Weberbauer 6519* (det. Dahlem).

San Martín: Tocache, *Poeppig 1828; 1895* (det. Hallier f., *J. velutina* Choisy).—Huánuco: Vine in sunny shrubs, flowers white, Pozuzo, *4638* (det. van Ooststroom, "probably"). Bolivia; Brazil.

Jacquemontia caudata Helwig, Notizbl. Bot. Gart. Berlin 9: 1137. 1927.

Fulvous velutinous tomentose twiner; stem 3 mm. thick; petioles short; leaves ovate or ovate-elliptic, scarcely cordate, mucro to 6 mm. long, 2–4 cm. long, 1.5–2.5 cm. wide; peduncles to 12 cm. long; cymes densely cupuliform, the subulate bracts to 17 mm. long; outer sepals narrowly ovate, caudate-acuminate, about 14 mm. long, the inner lanceolate-ovate, acuminate, marginally glabrescent, about 9 mm. long; corolla blue, 17 mm. long, lightly 5-sinuate; filaments little dilated basally; style 1 cm. long.—Very similar to *J. guyanensis* Meissn. with more obtuse leaves, equally long and broader sepals (author). F.M. Neg. 13753.

Cajamarca: Rainy-green formation, Valley of the Río Llancan, Prov. Cutervo, 1,600 meters, *Weberbauer* (no number), type.

Jacquemontia corymbulosa Benth. Bot. Voy. Sulphur 137. 1844. *J. Weberbaueri* Helwig, Notizbl. Bot. Gart. Berlin 9: 1136. 1927.

Softly short-tomentulose twiner, including the sepals or the slender stems glabrate toward the somewhat ligneous base; petioles 2–6 mm. long or sometimes about twice as long; leaves subrotund or broadly cordate-ovate, abruptly cuspidate-mucronate, often 3.5–5 cm. long, 3–4 cm. wide or the upper smaller, the nerves obscurely impressed above, rather prominent beneath; peduncles 5–12 cm. long; flowers many in dense umbelliform cymes; bracts setaceous, about 2 mm. long; sepals acuminate, the ovate outer 6–7 mm. long, the inner 4–5 mm. long, glabrescent; corolla blue, broadly funnelform-campanulate, 1.5 cm. long; filaments 7 mm. long, shortly dilated at base; style 6 mm. long, stigma lobes short-oblong, complete; calyx scarcely as long as the glabrous 4-valved capsule.—Description of filaments and style after Helwig, whose proposed species ex char. and negative is apparently the same as Bentham's type from Guayaquil. This may be *J. parviflora* (Vahl) Roberty according to Roberty (Candollea 14: 32. 1953) but that species has filiform stigmas; cf. van Ooststroom (Blumea 3: 270. 1939). F.M. Neg. 13774.

Cajamarca: Open formation below Santa Cruz, Hualgayoc, 1,700 meters, (*Weberbauer 4154*, type, *J. Weberbaueri*). Ecuador.

Jacquemontia elegans Helwig, Notizbl. Bot. Gart. Berlin 9: 1137. 1927.

Twining, the stem sparsely and shortly pilose, about 1 mm. thick, petioles slender, about 1–2 cm. long; leaves ovate or elliptic-ovate, broadly rounded from base, mucro 1 mm. long, 3–4 cm. long, about 2–3 cm. wide, subglabrous above, beneath sparsely and remotely pubescent with rather rigid trichomes, especially on the prominent nerves; peduncles to 6 cm. long, apically bifid, 2–4 (or several) -flowered; sepals equal, oval, rounded-obtuse or subacute, glabrous or sparsely pilosulous, about 4 mm. long; corolla blue, 23 mm. long; filaments subequal, 13–14 mm. long; style 19 mm. long, stigma bilobed, shortly complanate.—Related to *J. gracilis* Choisy with very short petioles, acute sepals (author). Resembles greatly *J. velutina* Choisy of Bolivia and Brazil but that with flowers 1.5 cm. long, the stigmas large. Cf. *J. secunda.* Roberty includes this in *J. parviflora* (Vahl) Roberty, Candollea 14: 32. 1952 (*J. paniculata* (Burm. f.) Hall. f.). According to van Ooststroom a species with filiform stigmas; cf. Blumea 3: 270. 1939.

Piura: Rainy green formation, Huancabamba, 1,900 meters, *Weberbauer 6058*, type. North of Huancabamba, 2,300 meters, *Weberbauer 6331*.

Jacquemontia floribunda (HBK.) Hall. f. Bot. Jahrb. 16: 543. 1893. *Convolvulus floribundus* HBK. Nov. Gen. & Sp. 3: 90, *pl. 210*. 1818.

Canescent tomentose all over and much-branched (branches terete) shrub, a meter or so high; petioles canaliculate, about 3.5 cm. long; leaves ovate-oblong, cordate, acuminate, mucronate, entire, 5–8 cm. long, 3 cm. wide or larger; corymbs pedunculate, di- or trichotomous, shorter than the leaves; pedicels about 5 mm. long, recurving in fruit; calyx lobes oblong, subobtuse, concave, the outer larger, about 4 mm. long; corolla short-funnelform, 12–15 mm. long, the widely spreading limb scarcely or obscurely 5-lobed, glabrous, blue; stamens unequal, included; filaments glabrous; anthers oblong, acute; ovary ovate-conic, glabrous, stigma bilamellate (Kunth).—Plate shows obtuse but long-mucronate leaves; those of the flowering branches, at least, are oblong-elliptic or ovate-elliptic, somewhat narrowed to the acute mucronulate tip. A specimen of fruit is greatly to be desired as it might permit of another disposition of this apparently aberrant species of *Jacquemontia*.

Cajamarca: Tomependa, *Bonpland*, type. Mouth of Río Chinchipe, Prov. Jaén, *Weberbauer 6229* (det. Helwig). Santa Cruz, *Weberbauer 4156* (det. Helwig).—Amazonas: Tupén, *Weberbauer 4156* (det. Helwig).

Jacquemontia hirsuta Choisy, Mém. Soc. Phys. & Nat. Genève 8, pt. 1: 63. 1838. *Convolvulus apocynoides* Schlecht. & Cham. Linnaea 5: 117. 1830, fide Meissner.

Conspicuously villous-hirsute with lax or spreading trichomes; petioles 2–8 mm. long; leaves ovate, rounded or somewhat cordate at base, acuminate, usually about 2.5–8 cm. long, 1–3 cm. wide; peduncles to 2.5 cm. long, sometimes longer, simple or bifid, the lax or congested cyme few- to many-flowered; branches and pedicels 2–4 mm. long; bracts linear, 2 mm. long; sepals herbaceous, equal, linear-lanceolate, long-acuminate, 6 mm. long; corolla broadly funnelform, 8–10 mm. long, the truncate limb subentire; style about as long as the stamens, the stigma lobes long-ovoid or spheroid, large; capsule included, globose, 4– finally 8-valved, the seeds glabrous.—Van Ooststroom in herb. used the name of Choisy, perhaps correctly, following Meissner, who, however, as did Choisy, included *C. sphaerostigma* Cav. Icones 5: 54, *pl. 481*. 1799, which ex char. and in the plate has a forked style longer than stamens, stigmas capitate, corolla lobed and, while glandular, said to be tomentose. *J. secundiflora* (Fernald) O'Donell, Lilloa 23: 467, *pl. 5*. 1950, known as near as southwestern Ecuador, has flowers in pseudoracemes on long pedicels, and, described by the great author as a *Convolvulus*, suggests the probable artificial classification of the family. Corolla vivid blue; Meissner cites a Ruíz and Pavón specimen and *Mathews 2051* without localities. Illustrated, Mart. Fl. Bras. 7: *pl. 110*. F.M. Neg. 27045.

San Martín: Tarapoto, *Woytkowski 35099* (det. Cuatrecasas); *Ule 6569* (det. Hallier f.).—Junín: Chanchamayo Valley, *Schunke 1427; 1549* (det. van Ooststroom).—Cuzco: Near Echarate, Urubamba Valley, *Weberbauer 7950* (det. van Ooststroom).

Jacquemontia lactescens Seem. Bot. Voy. Herald 171. 1854. *J. eriocephala* (Moric.) Meissn. var. *maynensis* Meissn. in Mart. Fl. Bras. 7: 303. 1869. *Ipomoea eriocephala* Moric. Pl. Nouv. Amer. 43. *pl. 29*. 1838.

Lactescent; stems and leaves reddish velvety pubescent; petioles usually longer than 2.5 cm.; leaves cordate-ovate, acuminate, 5–6 cm. long, about 3 cm. wide; peduncles twice as long as petioles, capitately 4–6-flowered; bracts ovate or obovate, obtuse, mucronate, velutinous without, glabrous within, equaling the sepals, the very hirsute white corolla about 3 cm. long; ovary villous (Seemann).—Leaves and stems glabrous or (under a lens) sparsely puberulent; flower heads about 2 cm. thick; outer bracts broadly oval or subrotund, tomentulose; sepals ferrugineous-villous (the var. after Meissn.). Possibly will be found to be a variant of *J. eriocephala* of Brazil, its bracts described as acuminate, the inner much narrower than the outer, the flowers somewhat shorter. The younger Peruvian specimens are lightly appressed sericeous, the calyces and white corollas ferrugineous pilose, older glabrate leaves to 11 cm. long, 6 cm. wide. Determinations by van Ooststroom as *J. lactescens*, or noted.

Junín: Meriatiriani, Pichis Trail, *Killip & Smith 26210*.—Loreto: Maynas, Yurimaguas, *Poeppig* (type, var.); *Williams 3978; 4406* (det. Standley); *4114; 4773; Killip & Smith 27594* (det. Standley); *27986; 29039; Ule 6275* (det. Hallier f.). Near Iquitos, *Klug 1329* (det. Standley); *Killip & Smith 29970*. Brazil; Panama.

Jacquemontia luxurians (Moric.) Hall. f. Bot. Jahrb. 16: 543. 1893. *Ipomoea luxurians* Moric. Pl. Nouv. Amer. 58. *pl. 39*. 1838.

Ligneous vine, the tips as well as the leaves beneath and sepals early somewhat puberulent; petioles slender, canaliculate, 1–1.5 cm. long; leaves elliptic- or lanceolate-oblong, shortly attenuate at base, subacuminately acute or mucronate, 5–7.5 cm. long, 1.5–3 cm. wide; peduncles 7.5–10 cm. long, stout, dichotomous, laxly many-flowered, pedicels 2–6 mm. long; bracts linear, 2–4 mm. long; sepals subcoriaceous, subrotund, finally glabrate or ciliolate, 8 mm. long, 6 mm. wide; corolla white, campanulate-funnelform, 3 cm. long, densely rufous-sericeous-banded, the limb spreading; capsule 2-celled.—Leaves simulate closely those of *Aniseia*, i.e. of *I. uniflora* (*I. martinicensis*). Determinations by van Ooststroom or noted.

San Martín: Juanjuí, *Klug 4383* (det. Standley).—Loreto: Río Nanay, *Williams 617* (det. Standley). La Victoria, *Williams 2662*. Pebas, *Williams 1656; 1870; 1851*. Caballo-cocha, *Williams 2454* (det. Standley). Yurimaguas, *Killip & Smith 28308* (det. Standley). Brazil.

Jacquemontia nodiflora (Desr.) G. Don, Gen. Syst. 4: 283. 1838. *Convolvulus nodiflorus* Desr. in Lam. Encycl. 3: 557. 1791. *J. verticillata* (L.) Urban, Symb. Ant. 3: 339. 1902.

More or less suffrutescent, fulvous puberulent or tomentose with fasciculate trichomes, finally glabrescent; petioles 0.5–1.5 cm. long; leaves ovate, rounded or subcordate at base, acute or acuminate, mucronulate, 2.5–5 cm. long, 12–16 mm. wide; peduncles 2–12 mm. long, pedicels 2–4 mm. long; bracts setaceous, the corymbiform cyme often many-flowered; sepals membranous, pubescent, subequal, 2–3 mm. long; corolla funnelform, 10–12 mm. long, white, glabrous; stigmas 2, filiform; capsules scarcely longer than calyx, globose, glabrous, 4- finally 8-valved; seeds papillose-scabrous.—Aspect of *Jacquemontia* but stigmas filiform as in *Convolvulus* (Meissner). A tomentose vine with small white flowers, described from Haiti; flowers only 1 cm. long in adjacent Ecuador, said to be 1.5 cm. long in the West Indies plants but structure the same (Svenson, Amer. Journ. Bot. 33: 477–8. 1946); the Peruvian specimen has flowers 10–12 mm. long.

Piura: Frias, 700 meters, Prov. Ayavaca, *Weberbauer 6429* (det. van Ooststroom). West Indies; tropical South America.

Jacquemontia parvifolia Helwig, Notizbl. Bot. Gart. Berlin 9: 1136. 1927.

Twining stem ligneous below, 1–2 mm. thick, shortly grayish hirsute-villous; petioles 5–10 mm. long or longer; leaves ovate, subcordate or rounded at base; slightly acuminate and mostly mucronate-apiculate in type, 1.5–2 cm. long, 8–15 mm. wide or somewhat larger, fuscous-tomentose, the nerves impressed above, prominent beneath; peduncles 4–6 cm. long, distinctly dichotomously branched above, 4–several-flowered; pedicels 5–7 mm. long; sepals glabrous, the outer ovate, more or less narrowed but very obtuse, 5 mm. long, the inner 6.5 mm. long; corolla blue, about 2.5 cm. long, the limb widely expanded; filaments subequal, 18–20 mm. long, slightly dilated at base; style about 2.5 cm. long.—Outstanding by its small leaves and few-flowered cyme (author). Probably only a variant of *J. Blanchetii*, the Stork and Horton specimen somewhat intermediate.

Huancavelica: Pampa-Salcabamba Trail, *Stork & Horton 10441* (det. Standley).—Apurímac: Between Ríos Pachachara and Pampas, Prov. Andahuaylas, *Weberbauer 5878*, type.

Jacquemontia pentantha (Jacq.) G. Don, Gen. Syst. 4: 283. 1838. *Convolvulus pentanthus* Jacq. Icon. Rar. 2: *pl. 316*. 1786–93.

J. violacea (Vahl) Choisy, Mém. Soc. Phys. & Nat. Genève 8, pt. 1: 61. 1838, and var. *abbreviata* Choisy in DC. Prodr. 9: 397. 1845. *C. violaceus* Vahl, Symb. Bot. 3: 29. 1794. *C. azurens* Rich. Act. Soc. Hist. Nat. Paris 1: 107. 1792. *J. azurea* (Rich.) Choisy, l.c. 62.

More or less puberulent or glabrescent; petioles about 0.5–2.5 cm. long; leaves ovate, rounded or cordate at base, acuminate, often 2.5–5 cm. long, 1.5–2 cm. wide; peduncles shorter to longer than leaves, cymes bifid, sometimes contracted, mostly many-flowered; pedicels 2–4 mm. long or obsolete; bracts linear-lanceolate, 2–4 mm. long, eglandular; sepals ovate-oblong or subrotund, acuminate, 4- finally 6 mm. long, the inner 2 shorter; corolla broadly funnelform, about 12 (–20) mm. long, subentire; stigmas oval; plane; capsule globose, 4- or finally 8-valved, the seeds scabriusculous.—The earlier named *Jacquemontia* is a plant with dense cymes, possibly distinct. *J. acuminata* Rusby, Mem. Torrey Bot. Club 6: 84. 1896, of Bolivia, is described as tomentose, sepals scarious-margined; it may be *Ipomoea evolvuloides* Moric. Pl. Nouv. Amer. 47. *pl. 32.* 1838. Compare *J. sphaerostigma* (Cav.) Rusby. Flowers violet (Klug); pale blue, white at base (Woytkowski). Illustrated, Mart. Fl. Bras. 7: *pl. 108.*

San Martín: Clearing, Juanjuí, *Klug 4334* (det. Standley). Shores of Lake Rikuri-cocha, *Woytkowski 35123* (det. Cuatrecasas). Zepelacio, *Klug 3535* (det. Standley, *J. acuminata*).—Lima: Sta. Eulalia, 1,200 meters, *Goodspeed 33008* (corolla 2 cm. long, det. Leonard, vel affine). To Guiana and Mexico.

Jacquemontia peruviana Helwig, Notizbl. Bot. Gart. Berlin 9: 1138. 1927.

Twining, more or less densely fuscous tomentose, especially the leaves beneath and outer sepals; stems minutely pilose or glabrescent below, about 2 mm. thick; petioles 0.7–2 cm. long; leaves ovate-oblong, subrotund or lightly cordate at base, acute with mucro 1–2 mm. long, 3–6 cm. long, 1–3 cm. wide, sparsely tomentose above; peduncles to 12 cm. long, distinctly dichotomously branched at apex, many-flowered, the cymes laxly umbelliform; outer sepals lanceolate, long-acuminate, 1 cm. long, the inner marginally glabrescent, ovate-oblong, acuminate, 7 mm. long; corolla blue, about 2 cm. long; filaments subequal, 8–11 mm. long; style 12 mm. long, stigma bilobed, complanate.—*J. ferruginea* Choisy, similar, has shorter peduncles, subequal shaggy sepals, mostly wider leaves (author).

Cajamarca: In rainy green shrubs, left side of the Marañón Valley at Pión, 1,300 meters, (*Weberbauer 7139,* type).

Jacquemontia prominens Helwig, Notizbl. Bot. Gart. Berlin 9: 1138. 1927.

Minutely pilose, twining, the stems about 2 mm. thick; petioles to 6 cm. long; leaves subglabrous, broadly ovate, deeply cordate, abruptly acuminate, 5–12 cm. long, 4–10.5 cm. wide; peduncles to 18 cm. long; flowers many, in umbelliform cymes; sepals unequal, subacute, the larger outer tomentose, oblong-ovate, 8 mm. long, the 2 inner obovate, shortly narrowed above, thin-margined, 4 mm. long; corolla blue, about 1.5 cm. long; filaments narrowly dilated below, minutely ciliate, about 11 mm. long, equaled by the style.—Resembles *J. violacea* Choisy with smaller leaves, nearly glabrous sepals and not greatly elongate peduncles (author). Trichomes, according to O'Donell, 3-radiate; since they vary in *J. unilateralis* from 4–6-radiate, it seems probable that they are not always only 3-radiate in this northern variant. Roberty, Candollea 14: 32. 1952, includes this in *J. pentantha.*

A low arching vine-like shrub with silvery leaves and light blue flowers, blooming late in the rainy season and seen as a vine on lomas; Svenson referred it to *J. secunda* (*J. unilateralis*), from which it is doubtfully distinct, at least specifically. One of the finest of the native wild flowers (Haught); beautiful and very common (Weberbauer).

Piura: Near La Brea, (*Haught & Svenson 11570*). La Brea and Talara, *Horton 11584; Haught 37.* Rainy green formation, Trias to Chulucanus, 300–400 meters, *Weberbauer 6431,* type. Ecuador.

Jacquemontia tamnifolia (L.) Griseb. Fl. Brit. W. Ind. 474. 1864. *Ipomoea tamnifolia* L. Sp. Pl. 162. 1753. *Convolvulus tamnifolius* (L.) G. F. W. Meyer, Prim. Fl. Essequeb. 95. 1818. *C. ciliatus* Vahl, Eclog. 2: 13. 1798.

Twining or trailing annual, the upper stems, large bracts without at base and sepals notably pilose-hispid; petioles usually shorter than the leaves, these ovate, more or less cordate, acutely acuminate, entire or remotely to coarsely dentate, commonly 4–8 cm. long, 2–4 cm. wide or somewhat larger, pilose or glabrate; peduncles often longer than the petioles, the outer bracts of the densely capitate inflorescences ovate, the inner lanceolate to linear; sepals equal length, linear-lanceolate, long-pilose, 7.5–12 mm. long; corolla funnelform, 1.5 cm. long, blue- or rose-tinted (deep blue, Klug); ovary glabrous; stigmas ellipsoid; capsule globose, 2-celled, 4-valved, the 4 seeds scabrous.—*J. guyanensis* (Aublet) Meissn., perhaps extending into Peru from northern Brazil, is stellately brown tomentose, inflorescences umbelliform, bracts small, linear. F.M. Neg. 23002 (Vahl).

Loreto: Clearing, Balsapuerto, *Klug 3065* (det. Standley). Warmer America and Africa.

Jacquemontia unilateralis (Roem. & Schult.) O'Donell, Lilloa 23: 470. 1950. *J. secunda* (R. & P.) Choisy, Mém. Soc. Phys. & Nat. Genève, 8, pt. 1: 62. 1838. *Convolvulus secundus* R. & P. Fl. Peruv. 2: 10, *pl. 117.* 1799. *C. unilateralis* Roem. & Schult. Syst. 4: 284. 1819 (*C. secundus* R. & P., not Desr., 1789).

Perennial, the vegetative parts more or less densely tomentose to laxly pubescent or glabrescent, the many cylindric stems 1–5 mm. thick, more or less ligneous, decumbent, much-branched, the internodes 2–15 cm. long; petioles 0.5–3 cm. long; leaves ovate to narrowly elliptic, rounded truncate or narrowly but not deeply cordate at base, acute or obtuse, mucronate or sometimes cuspidate, 2–9 cm. long, 1–6 cm. wide, the nerves prominent; cymes 2–many-flowered, corymbiform, peduncles 1.5–17 cm. long, bracts linear, 4–8 mm. long, the secondary peduncles 2–25 mm. long, bractlets linear, 3–5 mm. long, pedicels 2–6 mm. long; corolla buds apically pubescent or glabrous; sepals ovate, concave at base, subobtuse or acute to acuminate, the outer (5) 7–10 mm. long, 4–7 mm. wide, the inner 5–7 mm. long, 3.5–4.5 mm. wide, all tomentose to glabrous, the latter hyaline-margined; corolla blue, campanulate, 17–28 mm. long (at least in Peru), slightly if at all pubescent; stamens 9–12 and 7–10 mm. long, filaments with short glandular broad trichomes, the anthers 2–2.5 mm. long; ovary glabrous, style 7–9 mm. long, stigmas ellipsoid, to 1.5 mm. broad, disk obscure; capsule enclosed by sepals, subglobose, 2-celled, 8-valved, 4–5 mm. in diameter; seeds rugose, 2.5–3 mm. long.—Isotype, Delessert Herb., Geneva, has 4–6-radiate trichomes, the similar *J. prominens* Helwig of northern Peru, 3-radiate (O'Donell, l.c., as description). F.M. Neg. 27048.

This is a plant which can serve as an ornament in gardens because of its large, light blue flowers; its root is purgative (Ruíz & Pavón).

Lima: Huarochiri, *Goodspeed & Metcalf 30221* (det. Leonard, *J. pentantha* (Jacq.) Don); *Goodspeed Exped. 11335; 11486.* Near San Bartolomé, *Weberbauer 5221.* Chosica to Matucana, *Mexia 4002; Vargas 4770.* Ambar, *Stork 11448.* Prov. Canta, *Ferreyra 1918.* Pachacamac, Lurín, *Ruíz & Pavón,* type.—Arequipa: Lomas de Atico, *Ferreyra 2514.* "Campanillas de lomas" (Ruíz & Pavón). Bolivia?

12. CONVOLVULUS L.

Twining or prostrate herbs, the calyx of the campanulate to funnelform flowers usually enclosed in a pair of large bracts or the bracts more or less distant. Style entire or parted only at tip. Pollen ellipsoid or spheroid, smooth. Stigmas filiform (typically) or clavate to linear. Ovary 4-ovuled, typically. Capsules globose, ordinarily 2-celled, the cells 2-seeded or by abortion 1-celled, mostly 2–4-valved, rarely dehiscing from the base (seeds dark).—Trichomes usually simple. Includes *Calistegia* R. Br., stigmas complanate, elliptic to linear-oblong, pollen globose, smooth or verruculose or glabrous; ovary incompletely 1-celled. Trichomes rarely with 2 arms. The flattened stigmas suggest *Jacquemontia;* it can be treated as a genus or included in one or another of the segregates of *Ipomoea*. *J. nodiflora* (Desr.) G. Don with small (1 cm. long) often crowded white flowers might be sought here.

Flowers large, the calyx concealed by the conspicuous bracts. *C. sepium.*

Flowers small or to 2 cm. long, the bracts minute or inconspicuous.
  Flowers 16–20 mm. long; leaves entire or subentire, oblong-elliptic, sagittate.............................*C. arvensis.*
  Flowers about 1.5 cm. long or shorter; leaves clearly crenate or cleft or suborbicular.
    Leaves sinuate-crenate, often 5–6 cm. long, short-villous unless in age.
      Flowers about 1.5 cm. long, subumbellate....*C. crenatifolius.*
      Flowers about 1 cm. long, 1 or 2...........*C. Hermanniae.*
    Leaves more or less pinnately cleft or, if merely crenulate, suborbicular, small..........................*C. laciniatus.*

Convolvulus arvensis L. Sp. Pl. 153. 1753.

Perennial, the prostrate, striately angled stems sometimes spreading for several dm., glabrate or minutely villosulous as the petioles (to 1 cm. long) and broadly oblong-elliptic, sagittate-auriculate obtuse or retuse leaves, these usually 2–4 cm. long, at least half as wide, or smaller or larger; peduncles about 2.5 cm. long or longer, 1 (–3) -flowered, medially narrowly bracted; calyx campanulate, the ovate-rotund hyaline-margined sepals 4–6 mm. long, slightly gibbous; corolla white, more or less pink-tinted or purplish without, obscurely if at all angulate, 16–20 mm. long; capsule glabrous.

Roots said to descend 6 meters or more in alluvial soils; often known as Bindweed and difficult to exterminate but now controlled, at least, by chemicals.

Lima: Río Blanco, *822* (det. van Ooststroom).—Puno: Near Puno, *Vargas 116* (det. Standley, *C. montanus* van Ooststroom). Widely spread European native.

Convolvulus crenatifolius R. & P. Fl. Peruv. 2: 10, *pl. 118, fig. a.* 1799. *C. crenatifolius* R. & P. var. *peruviana* Hall. f. Jahrb. Hamburg 16: Beiheft 3: 34. 1899.

Shrub, villosulous, especially the younger parts, or glabrate, or essentially glabrous in age; stems terete, trailing or twining on low plants; petioles 0.5–2 cm. long; leaves cordate-ovate to -lanceolate, the rounded or usually acute auricles often somewhat dentate, the margins to apex more or less sinuate-crenate to the acute mucronulate tip, commonly 5 or 6 cm. long, about a third as wide, sometimes smaller or considerably larger; peduncles shorter or somewhat longer than leaves, striate-angled as the subumbellately disposed pedicels, these 3–10 mm. long, bracts almost minute; sepals ovate- or elliptic-oblong, scarious-margined, subobtuse, the outer early short-villous, about 6 mm. long; corolla white or roseate (at least on fading), about 1.5 cm. long, lobulate, somewhat villous-banded especially above; capsule globose, glabrous.—The negative is the variety of Hallier f., which is Ruíz and Pavón material as it was represented at Dahlem. The authors gave the habitat as hills of Chancay and Huánuco. Determinations by van Ooststroom. F.M. Neg. 13781.

Huánuco: Near Huánuco, *Ruíz & Pavón*, type; *2058*. Yanahuanca, *1194; 1233*.—Junín: Tarma, *Killip & Smith 21878*.—Cuzco: Haudquina to Yucay, Valle del Urubamba, *Herrera 3615* (det. Standley). Calca, *Vargas 705* (det. Standley).—Moquegua: Yogo, below Carumas, *Weberbauer 7274*. Chile. "Huillko."

Convolvulus Hermanniae L'Hér. Stirp. Nov. 67: *pl. 33.* 1784–85. *C. crenatus* Jacq. Coll. 2: 277. 1788; Icon. Pl. Rar. 2: *pl. 315.* 1786–93, fide Choisy. *Ipomoea Hermanniae* (L'Her.) G. Don, Gen. Syst. 4: 276. 1838.

Trailing velvety villous perennial, the elongating stems rather coarse, striate, terete or angulate toward base; petioles 1–2 cm. long; leaves sagittately cordate-lanceolate or oblong-ovate, obtuse or subacute, mucronulate, sinuate-crenate or the auricles somewhat dentate, often about 5 cm. long, 1.5–2 cm. wide; peduncles shorter than or scarcely as long as the leaves, 1–2-flowered; pedicels 5–10 mm. long, bracts linear; sepals herbaceous, ovate, acuminate, 6–8 mm. long, little shorter than the broadly funnelform white corolla.

Lima: Trailing over large rocks, *291* (det. O'Donell). Matucana and Huará, Prov. Chancay, *Ruíz & Pavón*. Surco near Lima, *Ruíz & Pavón* (fide Pilger).—Cuzco: Among shrubs, Machu-Picchu, *West 6412* (det. Johnston). Chile and Argentina to Mexico(?). "Impertinente," "emedadera" (Ruíz & Pavón).

Convolvulus laciniatus Desr. in Lam. Encycl. 3: 546. 1791. *C. montanus* van Ooststr. Recueil Trav. Bot. Néerl. 30: 199. 1933, fide O'Donell, in herb.

Stems slender or typically filiform and glabrous; petioles short (in Peru 4–8 mm. long); leaves scarcely 2.5 cm. long, typically laciniately pinnatifid, glabrous or subpubescent, the subacute opposite laciniae 2–3-parted; peduncles erect, 1-flowered, as long as the leaves, the pedicels 6 mm. long; bracts linear-ovate, acute; sepals equal, ovate, subacute, scarious, 6–8 mm. long, the outer early rufosericeous (margined), later, as the inner, glabrous, mucronulate; corolla white; capsule glabrous.—After Choisy in DC. Prodr. 9: 411. 1845, the type by Commerson from Montevideo; the Peruvian plants have subentire or closely crenate, often suborbicular leaves but *Pennell 14197* has subpinnatifid leaves, the divisions oblong-linear; more material showing variation is necessary before the species (or 2 species) are understood; possibly the Peruvian plant (*C. montanus*), which the author did not compare, is distinct or at least a variety, and except for O'Donell's decision, I would probably have followed van Ooststroom. Similar variation, however, is accepted for *Ipomoea Plummerae* Gray; its pinkish-white, yellow-green or red-throated flowers are about 1.5 cm. long, leaves quadrate- or angulate-reniform, 5–10 mm. long, 4–9 mm. wide, bracts triangular, 1.5 mm. long, pedicels 1.5–3 mm. long, sepals glabrous, obtuse or emarginate, anthers ovoid, capsule globose, little exceeding calyx (van Ooststroom); cf. *I. minuta* R. E. Fries (see *I. muricata*), to which the author referred a specimen from Tacna; an Argentine specimen so determined is rather *C. laciniatus* with its small flowers and broader sepals. Illustrated, van Ooststroom, l.c. 194, *fig. 3*.

Junín: Near Huancayo, 3,300 meters, *Killip & Smith 22018* (type, *C. montanus*).—Huancavelica: Near Pampas, *Stork & Horton 10240* (det. Standley).—Cuzco: Below Oropesa, *Pennell 14197* (det. van Ooststroom). Near Cuzco, *Herrera 3177; 3185* (det.

O'Donell). Sicuani, Prov. Canchis, 3,550 meters, (*Hicken*). —Tacna: Near Tacna, (*Woitschach*). Chile; Argentina.

Convolvulus sepium L. Sp. Pl. 153. 1753. *Calystegia sepium* (L.) R. Br. Prodr. 483. 1810.

Perennial from a slender horizontal root-stock, the trailing or climbing stems often several dm. long, glabrous, more or less puberulent or more often glabrate as the plant in general except the large white or pink flowers that are enclosed basally by 2 foliose bracts; petioles slender, shorter than the lanceolate or ovate leaves (about 3–9 cm.), bracteate at base, the basal lobes subtruncate or angled; peduncles angled, often longer than the leaves, the single flower 5–7 cm. long; bracts cordate-ovate, rounded to acuminate, typically about 1– nearly 2 cm. long; stigmas oval-oblong.—The outstanding bracts, campanulate corolla and broad stigmas are the basis of a separate generic name for the species for those who prefer it; however, the characteristics are developed in varying degree in the family generally. Ruíz and Pavón found an infusion of its milky sap used as a laxative.

Lima: Surco and Lurín, *Ruíz & Pavón*. Europe.

13. CUSCUTA [Tourn.] L.

Reference: Yuncker, Mem. Torrey Bot. Club 18: 109–331. 1932.

Slender even filiform parasitic (by haustoria) twining herbs (rarely slightly chlorophyllose), the leaves reduced to scales. Flowers ordinarily cymose, sometimes racemose, the short corolla usually 4–5-cleft. Stamens opposite the basal, scale-like, more or less fringed or fimbriate structures. Ovary 2-celled, each cell 2-ovuled. Styles (rarely lacking) distinct to completely united, the stigmas globose-capitate to somewhat elongated. Capsules indehiscent to quite evenly or unevenly dehiscent. Embryo filiform or enlarged at one end, without cotyledons.

The careful and discriminating monograph of this unique group —the Dodder—by the eminent student of the Piperaceae is obviously so satisfactory that it has been compiled with no basic change for the species known in Peru. Dodders should be collected more generally and probably additional species, perhaps some unknown, would be discovered. A number widely spread by cultivated plants have been included without known records from Peru as in all probability they occur or will be introduced. Mention may be made of three species possibly introduced from the Old World, all of which—unlike the Peruvian species—have stigmas much longer than thick; *C. Epilinum* Weihe (see Yuncker, l.c., 277) is one of the species distributed with a host plant, in this case almost always *Linum*, which, however, is not commonly cultivated in Peru; it has densely clustered 3 mm. long flowers, more membranous than fleshy, the corolla urceolate, scales truncate or bifid and thick, stigmas as long as styles; another, mostly on legumes, *C. Epithymum* Murray (Yuncker, l.c., 283), is similar but the scales are spatulate, and the styles and filiform stigmas are about twice as long as the ovary; *C. approximata* Babington (Yuncker, l.c., 295), related to the last, has fleshy flowers, usually bifid scales.

The native Peruvian species belong to the subgenus *Grammica* (Lour.) Englm. with distinct styles and globose or slightly elongate stigmas, the capsules circumscissile, sometimes tardily or irregularly (section *Eugrammica* Yuncker) or not circumscissile (section *Cleistogrammica* Engelm.); in Peru only *C. obtusiflora*, *C. suaveolens* and perhaps *C. Haughtii* belong to the latter; fruit of *C. peruviana* is unknown. The obtuseness and acuteness of calyx and corolla lobes, while used in the key for expediency, are probably specific characters and may or may not indicate relationship.

Styles rather stout, more or less subulate and tapering into the ovary.

Scales not developed; calyx as corolla lobes obtuse, former not imbricate.................................*C. grandiflora.*

Scales developed; calyx lobes imbricate at base, obtuse, as corolla lobes.

Corolla lobes spreading; stigmas globose...........*C. odorata.*

Corolla lobes erect in fruit; stigmas subconic......*C. globiflora.*

Scales developed (united in *C. Haughtii*); corolla, sometimes calyx lobes, acute.

Calyx lobes slightly if at all imbricate, obtuse or subacute.

Corolla lobes about half as long as tube.

Calyx and corolla tube subequal; capsules not circumscissile, styles divergent...............*C. obtusiflora.*

Calyx clearly shorter than corolla tube; capsules circumscissile, styles erect.....................*C. rubella.*

Corolla lobes and tube subequal.

Flowers yellow or reddish, not fleshy, 3–4 mm. long.
C. lucidicarpa.

Flowers purple or yellowish, fleshy, 4–5 mm. long. . *C. bella.*

Calyx lobes more or less imbricate, clearly acute or cuspidate.

Flowers 5–10 mm. long, subsessile or sessile.

Corolla lobes oblong; stamens sessile. . . . . *C. paitana.*

Corolla lobes ovate; filaments stout. . . . . *C. foetida.*

Flowers 2.5–3 mm. long, pedicellate. . . . . *C. acutiloba.*

Styles slender, usually little thicker at base than at apex.

Corolla and calyx lobes obtuse.

Flowers 2–3 mm. long, subsessile in dense clusters. *C. americana.*

Flowers about 4 mm. long, subcorymbose pedicels about as long. . . . . *C. corymbosa.*

Corolla and calyx lobes acute or latter subacute.

Calyx lobes imbricate at base; flowers 4–6 mm. long.

Flowers pedicellate in lax cymes, yellow or reddish. *C. peruviana.*

Flowers sessile in dense clusters, white. . . . . *C. Cockerellii.*

Calyx lobes free to base; flowers 2–4 mm. long.

Corolla grooved, globose-campanulate, 2–3 mm. long, tube and calyx subequal.

Scales united; capsules (apparently) not circumscissile. *C. Haughtii.*

Scales united below middle; capsules more or less circumscissile. . . . . *C. partita.*

Corolla not grooved, early campanulate, 3–4 mm. long, tube longer than calyx.

Stems slender; corolla lobes lanceolate; capsules not circumscissile. . . . . *C. suaveolens.*

Stems filiform; corolla lobes ovate; capsules circumscissile. *C. Hitchcockii.*

Cuscuta acutiloba Engelm. Trans. Acad. Sci. St. Louis 1: 478. 1859; 208.

Stems medium to slender, the purple or reddish (rarely white) flowers 2.5–3 mm. long (pedicels sometimes longer) in lax cymose-umbellate clusters; calyx as long as corolla tube, the ovate acuminate or cuspidate lobes somewhat angled at sinuses and imbricate at base; corolla at first campanulate, the lanceolate acutely acuminate lobes mostly longer than the tube, reflexing, imbricate at base;

stamens very short, the small orbicular anthers about as long as the filaments; scales narrowly oblong, scarcely reaching the stamens, minutely and sparsely denticulate or with processes, joined or bridged much below the middle; styles subulate-conical from the globose ovary; capsules depressed globose, membranous, early circumscissile, the corolla withered around it; seeds 1–1.5 mm. long, roundish or ovoid, the hilum short.—After Yuncker (as other descriptions and determinations), who remarks: well-marked with its purplish flowers and long recurved corolla lobes. Illustrated, Yuncker, l.c., and Amer. Journ. Bot. 9: 567, *pl. 1, fig. 5a–e.*

Lima: Bridge of Obrajillo, (*Mathews*, type). Canta, (*Pennell 14595*).—Arequipa: Mt. Estuquina, *Weberbauer 7443*. Near Arequipa, flowers white, *Pennell 13242*. Mejía, (*Guenther & Buchtien 159*, det. Bruns). Bolivia.

Cuscuta americana L. Sp. Pl. 124. 1753; 219.

Stems medium, the subsessile flowers 2–3 mm. long in dense many-flowered clusters; calyx subtubular with broadly ovate obtuse imbricate lobes and often as long as the tube of the cylindric corolla, this, except in fruit, with only the short ovate erect or suberect lobes exserted; scales triangular or rather oblong, sometimes reaching to the stamens, usually united more than medially, the many border processes minute; filaments shorter than the oval, often apiculate anthers; styles slender, longer than ovary and at least about equaling the corolla lobes, the stigmas capitate; capsules globose to ovoid, circumscissile and characteristically topped with the withered corolla; seeds about 1.5 mm. long, usually only 1 developing and often with an elongate groove, the hilum small or nearly obsolete.—The common Dodder of the West Indies and known to the monographer from Florida and Mexico to Ecuador and Argentina; no doubt will be found in Peru. Illustrated (Yuncker, l.c., and Mart. Fl. Bras. 7: *pl. 126, fig. 1*.

Peru (cf. note above). West Indies; widely distributed or spread especially southward from Mexico.

Cuscuta bella Yuncker, Mem. Torrey Bot. Club 18: 203, *fig. 74*. 1932.

Stems slender to medium with sessile purple or yellowish fleshy papillate flowers 4–5 mm. long in few-flowered glomerules; calyx usually nearly enclosing the corolla tube, parted about medially, the slightly imbricate triangular-ovate lobes acute or subobtuse, the similar acute lobes of the campanulate corolla spreading, shorter than the tube; short processes of the basally joined scales touching the subsessile oval anthers; styles conic-subulate, shorter than ovary, the conical topped capsules circumscissile.—Resembles *C. rubella* and *C. lucidicarpa* but differs at least as to type in floral characters. The flowers are very attractive with their purple corollas and yellow anthers (author).

Junín: Tarma, (*Killip & Smith 21827*, type).

Cuscuta Cockerellii Yuncker, Mem. Torrey Bot. Club 18: 230, *fig. 102.* 1932.

Stems slender; flowers white, somewhat glandular, 4–6 mm. long, sessile in dense globose clusters; calyx about half as long as corolla, slightly granular, deeply parted, the broadly ovate acute lobes imbricate; corolla narrowed toward the lanceolate acute recurving lobes, these about half as long as the tube; anthers large, sessile, oblong; scales oblong-spatulate, much shorter than the tube, fringed with short processes mostly apically; styles slender, much longer than the subumbonate acute ovary, the large convoluted stigmas globose or slightly elongate; capsules depressed-globose, circumscissile, a little pointed about the style bases, retaining the corolla; seeds mostly 4, about 1 mm. long, oval, flattened on two sides.—Commemorates a distinguished naturalist, who was, particularly, an entomologist.

Arequipa: Yura, (*Cockerell*, August, 1923, type, U. S. Nat. Herb.).

Cuscuta corymbosa R. & P. Fl. Peruv. 1: 69, *pl. 105, fig. b.* 1798; 222. *C. corymbosa* R. & P. var. *microlepis* Engelm. Trans. Acad. Sci. St. Louis 1: 484. 1859, fide Yuncker.

Stem medium, the flowers (as pedicels) about 4 mm. long (or 3–7), in corymbose panicles; calyx membranous with short obtuse lobes, these slightly imbricate and typically reaching about the middle of the cylindric tube of the corolla, this with oblong-ovate obtuse erect to spreading lobes a fourth to half as long; scales narrowly oblong, united toward base, only about half as long as the tube, with few to many minute processes or denticulations; stamens about half as long as the corolla lobes, the filaments typically subequaling the ovate-cordate anthers; styles slender, longer than ovary, finally exserted; capsules globose (in type), circumscissile, retaining the withered corolla; seeds 1–4, about 1.5 mm. long, oblique, the hilum short.—The Arequipa collections probably represent species known from there (as *C. Hitchcockii*) rather than this or the var. *stylosa* (Choisy) Engelm., l.c., known to Yuncker only from Mexico; Peruvian specimen, not seen by me, has flowers 4–6 mm. long, calyx usually not reaching middle of cylindric or subcylindric corolla, ovary globose-ovoid to conic; var. *grandiflora* Engelm., l.c. 483 (or *C. cymosa* Willd.), known from Ecuador to Mexico, has flowers 3–7 mm. long, calyx often more than half as long as tube of the more or less globose and grooved corolla, the anthers sessile or subsessile. Perhaps in northern Peru is the rather similar *C. prismatica* Pavón ex Choisy, Mém. Soc. Phys. & Hist. Nat. Genève 9: 278. 1841 (Yuncker, l.c., 226, *fig. 96*), with subsessile densely clustered flowers 6 mm. long, papillate deeply parted calyx and granulate corolla, both with acute or subacute lobes, sessile anthers, scales with a few processes toward and at apex. Illustrated, Yuncker, l.c., 223, *fig. 94*, and Amer. Journ. Bot. 9: 573, *pl. 4, fig. 20*).

Huánuco: Pozuzo, *Ruiz & Pavón*, type (Herb. Madrid specimen, det. Pilger).—Arequipa: Mejía, (*Guenther & Buchtien 161; 162;* var. *stylosa, 160,* all det. Bruns). To Mexico?

Cuscuta foetida HBK. Nov. Gen. & Sp. 3: 122. 1819; 206.

Stems medium to coarse; flowers sessile, 4–7 mm. long, in dense many-flowered clusters, these sometimes about 2.5 cm. in diameter; corolla tube and calyx ordinarily about equal, the lobes of both triangular-oval, acute to acuminate, imbricate; corolla early campanulate-cylindric, slightly saccate toward base, the erect to finally reflexing lobes typically at least half as long as tube; stamens much shorter than corolla lobes, filaments short, stout, anthers oval-oblong; scales oblong or somewhat oval, shorter than tube, shortly fimbriate, joined at about a quarter of their height; styles conic-subulate, at least about as long as the ovary; capsules in the withered corolla depressed globose, circumscissile; seeds about 1.5 mm. long, somewhat rostrate, the hilum short, oblong.—Illustrated, Yuncker, l.c. 207.

Arequipa: Mejía, (*Guenther & Buchtien 158,* det. Bruns). Without data, (*Jussieu*). Ecuador.

Cuscuta globiflora Engelm. Trans. Acad. Sci. St. Louis 1: 520. 1859; 194.

Much like *C. odorata;* flowers 4–5 mm. long, thick and fleshy in texture, nearly as broad as long, the lobes often minutely fimbriate, each flower usually subtended by a large ovate-orbicular bract;

corolla urceolate in fruit, the lobes connivent over the capsule; stamens short, the stout filaments shorter than the oval anthers; scale fringes short or medium in length; stigmas more or less conic or flattened and convoluted, not round or globose, sometimes not much thicker than the styles; seeds about 1.5 mm. long, 2–4, with short oblong hilum.—After Yuncker, who remarks that the connivent corolla lobes and peculiar stigmas easily distinguish the species; the Cuzco specimens seen are too immature or too nearly destroyed by insects to be surely identified but the species probably replaces *C. odorata,* at least as to typical form, in southern Peru. Illustrated, Yuncker, l.c., and Amer. Journ. Bot. 9: 564, *pl. 2, fig. 9a–e.*

Cuzco: (*Pentland,* type). Limatambo, Prov. Anta, *Vargas 337* (det. Standley, *C. odorata*). Calca, *Vargas 684.* Marcapata, *Weberbauer 7811.* To Argentina.

Cuscuta grandiflora HBK. Nov. Gen. & Sp. 3: 123, *pl. 213.* 1819; 183.

Stems medium in size, sometimes red or reddish, with loose cymose clusters of large (4–6, rarely only 3 mm. long) yellowish (or corolla white, reddish or often with a dark band in throat) flowers with no scales; pedicels mostly shorter than flowers; calyx broad, about as long as corolla tube, the triangular-ovate obtuse lobes not imbricate; corolla shortly and broadly campanulate, the broadly ovate obtuse lobes overlapping; stamens inserted below the sinuses, reaching nearly to middle of lobes, the oval often arcuate anthers shorter than the subulate filaments; styles stout, shorter than globose ovary, the stigmas flattened or globose; capsules depressed-globose, circumscissile, the withered corolla at base papillate as all parts of ovary; seeds 3–4, roundish, 1.5–2 mm. long, rough, the hilum oblong.—Illustrated, Yuncker, l.c., and Amer. Journ. Bot. 9: 560, *pl. 1, fig. 6a–d.*

Infects most cultivated plants; believed by the Indians to cause sterilization (Herrera).

Huánuco: Yanahuanca, *1230.*—Junín: Tarma, *1043; Killip & Smith 21905.*—Huancavelica: East of Mejorada, *Stork & Horton 10912.* Salcabamba, *Stork & Horton 10269.*—Cuzco: Valle del Huatanay, (*Herrera 678*). Near Cuzco, *Weberbauer 4930; Herrera 2354.* San Sebastian, *Pennell 13613.* Yucay, *Soukup 749.* Prov. Calca, *Vargas 682* (det. Standley); *Cook & Gilbert 249.* Marcapata, *Weberbauer 7798.* Near Tinta, *Cook & Gilbert 219.* Saxaihuamán, *Vargas 338.*—Puno: Limbani, *Metcalf 30485.*—Moquegua: Carumas, *Weberbauer 7305.* Colombia to Chile and Argentina. "Mallunhua," "arhui-arhui."

Cuscuta Haughtii Yuncker, Mem. Torrey Bot. Club 18: 153, *fig. 27.* 1932.

Stems slender or filiform, sometimes bright orange; flowers yellowish-red, somewhat fleshy, 2–3 mm. long on mostly shorter pedicels in cymose umbellate clusters, both calyx- and corolla-lobes triangular ovate, acute; calyx scarcely as long as corolla tube, loose, deeply parted, the lobes usually revolute toward the base; corolla globose, strongly grooved, the spreading lobes about three-fourths as long as the tube, longer than the stamens, these with filaments and orbicular anthers subequal; scales short, truncate and united apically to form a more or less complete band, sometimes indented; styles slender, shorter than the depressed ovary, the small stigmas globose; capsules depressed globose, enclosed in the withered corolla, not circumscissile (so far as determined); seeds about 1 mm. long, rounded, flattened on one surface, scurfy, hilum subterminal, very short.—Distinctive with its reddish flowers and short scales, and it is one of the few with globular deeply furrowed corollas; differs from *C. partita* Choisy, 232, Bolivia to Colombia and West Indies, in form of scales, length of styles, non-opening capsules; from *C. stenolepis* Engelm., 162, of Ecuador, in its acute calyx lobes and shape of scales (author). The similar and allied *C. acuta* Engelm. of the Galapagos has well-separated scales, longer stamens.

Piura: East of Cape Parinas, *Haught 154*, type. Negritos, *Haught 58.* Talara, *Johnston 3514; Horton 11569* (det. Johnston). Ecuador.

Cuscuta Hitchcockii Yuncker, Mem. Torrey Bot. Club 18: 230, *fig. 101.* 1932.

Stems nearly filiform; flowers red, glandular, 3 mm. long, shortly pedicellate, apparently in paniculate cymes; calyx lobes triangular, acute, not imbricate, shorter than corolla tube; corolla lobes lanceolate, spreading and often reflexed at acute tips, somewhat shorter than campanulate tube; filaments shorter than oval-ovate anthers; scales about reaching the stamens, oblong, shortly fringed to and usually on their union below the middle; styles longer than the apically incrassate ovary; capsules globose, circumscissile, enveloped by the withered corolla.—Commemorates a famous agrostologist.

Arequipa: Mollendo, (*Hitchcock 22425*, type, U. S. Nat. Herb.).

Cuscuta lucidicarpa Yuncker, Bull. Torrey Club 50: 277, *fig. 1*. 1923; 202.

Resembles the allied *C. rubella* but flowers 3–4 mm. long, more or less papillate, subsessile or sessile, solitary or in few-flowered clusters, the red or yellowish calyx not thick or fleshy, medially parted, the slightly or not imbricate lobes (as those of corolla) triangular-ovate, obtuse or subacute; scales reaching the stamens or slightly shorter; capsules depressed globose, finally semi-transparent, circumscissile, the withered corolla about the upper portion; seeds 4, triangular, the hilum short.

Junín: Tarma, *1035*, type; *Killip & Smith 21843; 21858; 21909*.

Cuscuta obtusiflora HBK. Nov. Gen. & Sp. 3: 122. 1819; 127.

Stems medium, the glandular subsessile flowers 2 mm. long, in dense glomerulate clusters; calyx about enclosing corolla tube, the free unequal rounded-ovate obtuse lobes usually irregularly serrulate; corolla lobes triangular-ovate, acute or subobtuse, spreading to reflexed, shorter than the short campanulate tube, longer than the stamens, these with rather stout filaments subequaling the oval or cordate anthers; scales oblong, fimbriate at the often truncate, or less frequently bifid apex, scarcely reaching the stamens, mostly free; styles rather stout, subulate, shorter than or about as long as the globose ovary, divergent, intrastylar operculum large; seeds ovate, about 1.5 mm. long, the oblong hilum diagonal.—The locality was given merely as "Andes of Peru." Illustrated, Yuncker, l.c. 128, and Amer. Journ. Bot. 10: *pl. 5, fig. 29a–e*.

Peru (without data, *Bonpland*). Argentina to southern United States; West Indies.

Cuscuta odorata R. & P. Fl. Peruv. 1: 69, *pl. 105, fig. a*. 1798; 192.

Medium-stemmed, the large (4–6 mm. long) flowers subsessile in dense lateral clusters, often spotted or tinged with red or purple; calyx mostly about as long as the corolla tube, the ovate-orbicular obtuse lobes imbricate, often unequal; corolla lobes erect to reflexed, typically about as long as or longer than the campanulate or short-cylindric tube, ovate, obtuse, overlapping, the stamens reaching to their middle or shorter; anthers oval, typically equaling the stout subulate filaments, these usually touched by the prominent typically densely fringed scales that are bridged medially or lower; styles subulate, rarely longer than the ovary, the globose stigmas sometimes reddish; capsule more or less depressed-globose, surrounded by the withered corolla; seeds about 2 mm. long, the hilum linear.—Curiously, the flowers, apparently, may be odorless (my *2897; 5962*), or fragrant (*3993*), or very unpleasant (*1229*). The species, including plants treated as variants, may be found to pass into *C. globiflora* Engelm. Described variations include var. *squarrulosa* (Yuncker, l.c. 193), calyx lobes abruptly divergent, corolla lobes usually shorter than tube, filaments shorter than anthers, and var. *Holwayana* Yuncker (Amer. Journ. Bot. 9: 564, *pl. 4, fig. 21f.* 1922), corolla lobes shorter than tube, sparser scale-fringe scarcely reaching stamens, capsule less depressed, rarely papillate (forma *papillosa,* Yuncker). Illustrated, F.M. Neg. 29321; Choisy, Mém. Soc. Phys. & Hist. Nat. Genève 9: 275, *pl. 2, fig. 3,* as *C. intermedia* Choisy; Yuncker, l.c., and Amer. Journ. Bot. 9: 564, *pl. 4, fig. 21a–e.*

Lima: Río Chillón, *Pennell 14382.* Lurín, *5962.* Vino, *756.* Matucana, *104; 148; 465; 2897; Stork & Horton 9137.* Río Blanco, *Killip & Smith 21684* (type, var. *squarrulosa*).—Huánuco: Pillao, *Ruiz & Pavón,* type. Mito, *1378.* Chinchapalca, *1587.* Panao, *2203.* Huánuco, *2377.* Muña, *3993* (type, var. *Holwayana,* f. *papillosa*). Yanahuanca, *1229.*—Puno: Near Oconeque, *Metcalf 30573* (det. Yuncker, var. *Holwayana*). Ecuador to Chile, Argentina, Brazil. "Huanco."

Cuscuta paitana Yuncker, Mem. Torrey Bot. Club 18: 206, *fig. 77.* 1932.

Stems yellow, medium to coarse; flowers yellow, 8–10 mm. long, closely subtended by a large oval bract in few-flowered or dense cymose clusters; calyx shorter than corolla, deeply parted, the ovate or elliptic somewhat acuminate lobes imbricate; corolla lobes oblong or nearly, acute, not overlapping, much shorter than the cylindric-globose tube; scales scarcely reaching the middle of the tube, spatulate, fimbriate apically, united (bridged) nearly basally; anthers oblong, sessile, styles subulate, as long as or longer than the globose ovary, the stigmas large.—Apparently related to *C. foetida* HBK. but capsule unknown (author), and recent collections also immature.

Piura: Talara, *Haught 11,* type. Amotape Hills and Parinas Valley, *Haught 100.* La Brea, *Weberbauer 7762.* East of La Brea, *Horton 11575* (det. Johnston).

Cuscuta partita Choisy, Mém. Soc. Phys. & Hist. Nat. Genève 9: 284, *pl. 5, fig. 3.* 1841; 232.

Stems medium; flowers reddish, glandular, 2–3 mm. long on shorter or longer pedicels in more or less dense umbellate-racemose clusters; calyx sometimes exceeding the corolla tube, the ovate-lanceolate lobes acute to acuminate; corolla globose-campanulate, grooved or angled, often granulate, especially the triangular-lanceolate acuminate lobes, these shorter than tube, the tip sometimes inflexed; filaments shorter or longer than the oval anthers; scales joined slightly below the middle, now and then reaching to stamens, moderately fimbriate; styles much longer than ovary; capsules circumscissile but tardily and irregularly in some specimens (Yuncker), globose, slightly depressed, retaining the corolla; seeds roundish, compressed, about 1 mm. long, the short hilum perpendicular.—Illustrated, Yuncker, l.c. 233, *fig. 105*, and Mart. Fl. Bras. 7: *pl. 128, fig. 6.*

Río Acre: (*Hoehne 1026*). Bolivia to Colombia and the West Indies.

Cuscuta peruviana Yuncker, Mem. Torrey Bot. Club 18: 151, *fig. 25.* 1932.

Inflorescence loosely branched, apparently cymose; flowers yellow, becoming reddish, 4–5 mm. long, the pedicels mostly longer; calyx about half as long as corolla tube, the ovate subacute lobes longer than broad, slightly imbricate at base; corolla lobes triangular-ovate, acute, half to three-quarters as long as cylindrical tube, erect to finally reflexed, thin, lineately incrassate below insertion of stamens, these shorter than lobes, the large oval anthers longer than the subulate filaments; seeds reaching to stamens, moderately fimbriate, bridged about medially or lower; styles much longer than the globose ovary, the stigmas somewhat convolute.—Seems to be distinguishable from *C. suaveolens* Seringe, 148, widely introduced from Chile, by the longer thinner reddish and eglandular flowers and also by the non-revolute slightly overlapping calyx lobes (author). Type locality not published by author nor noted by me at Berlin-Dahlem; however, from the number it was probably from a central department, as Junín.

Peru (see note above; *Weberbauer 1551*, type).

Cuscuta rubella Yuncker, Bull. Torrey Club 50: 278, *fig. 2.* 1923; 201.

Stems slender with mostly red flowers, 2–2.5 mm. long, sessile in small dense few-flowered glomerules; calyx rather fleshy, clearly shorter than the corolla tube, deeply parted, the oval obovate to spatulate obtuse lobes more or less uneven, loose about the subglobose corolla, this furrowed, somewhat papillate or verrucose at base of tube, its much shorter erect or spreading lobes acute; anthers large, oval, sessile or subsessile well above the oblong minutely fimbriate and low-bridged scales; styles conic-subulate.—Mature capsules not seen but evidently circumscissile and in the withered corolla; a pretty species closely allied with *C. lucidicarpa* (author).

Lima: Matucana, *371*, type.

Cuscuta suaveolens Seringe, Ann. Sci. Phys. Nat. Agric. & Indust. 3: 519. 1840; 148.

Stems slender to medium; flowers membranous, more or less glandular, 3–4 mm. long, on mostly slender pedicels in racemose clusters; calyx lobes ovate, subacute, often revolute but not imbricate, the sinuses somewhat rounded, much shorter than the early short-campanulate corolla, this with erect ovate acute lobes inflexed at tip, about half to three-fourths as long as tube; filaments subulate, about as long as the oval to oblong anthers; scales usually not quite reaching the stamens, oblong-ovate, shortly fimbriate, united below the middle; styles slender, at least about as long as the ovary; capsules globose in the expanded corolla, not circumscissile, the 2–4 seeds 1.5–2 mm. long, roundish, the oblong hilum perpendicular.—Was formerly confused in Peru with *C. corymbosa* Ruíz and Pavón. Frequently on legumes, especially *Medicago sativa*, with the seeds of which it has been widely disseminated (Yuncker). *C. campestris* Yuncker (*C. arvensis* in litt.), 138, originally from Texas but sporadically distributed (as in Argentina) on a variety of hosts, has flowers in globose clusters, calyx lobes suborbicular, imbricate, scales long-fimbriate, reaching stamens. Illustrated (Yuncker, l.c. 139).

Peru (no doubt; see note above). Southern South America; adventive in all continents.

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